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The right to science between national and international recognition – domestic contributions to the clarification of its normative content

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SUMMARY

1. Introductory remarks

The right to enjoy the benefits of scientific progress and its applications (REBSPA) or merely the right to science is positivized as a human right in international law instruments, among others, in the Universal Declaration of Human Rights (UDHR) and in the International Covenant on Economic, Social and Cultural Rights (ICESCR).[1] The REBSPA has been revisited in the Venice Statement[2] and, in 2012, it was the subject of a United Nations Report of the Special Rapporteur in the field of cultural rights.[3] Later in 2017 it was highlighted within the UNESCO Recommendation on Science and Scientific Researchers.[4] In April 2020, the United Nations Committee on Economic, Social and Cultural Rights published the General Comment n. 25(2020) on science and economic, social, and cultural rights.[5]

Within the international framework available, the normative content of this right can be approached autonomously[6] and in conjunction with other human rights, especially the right to health.[7] According to Yvonne Donders, Article 15 of the ICESCR establishes two main dimensions of the right to science, implicating the related state obligations: the general right to enjoy the benefits of scientific progress and the right of scientists to freely conduct science and have their work protected.[8] Moreover, the right encompasses the state obligation to protect from adverse effects of science and to foster scientific progress.

Since the first formulation of the right to science,[9] there has been considerable progress[10] in identifying the right holders, the obligation and responsibility bearers, the content of the right in terms of substance, nature and scope.[11] Nonetheless, the international provisions are broad and general and the clarification of the normative content of the right still requires further development.[12] In addition, despite being present in some constitutional texts, the right to science is not often established in domestic legal orders as an explicit autonomous right.

1 Chapman, Audrey R., 2009; Malyska, Antanina, 2019.

2 American Association for the Advancement of Science [AAAS], 2009.

3 United Nations, Human Rights Council, 2013.

4 United Nations Educational, Scientific and Cultural Organization [UNESCO], 2017.

5 United Nations, Econ. & Soc. Council, Comm. on Economic, Social and Cultural Rights, 2020.

6 Vitullo, Margaret Weigers; Wyndham, Jessica, 2013.

7 Donders, Yvonne, 2011.

8 Donders, Yvonne, 2011.

9 Romano, Cesare P. R., 2020.

10 Malyska, Antanina, 2019.

11 Smith, Tara, 2020.

12 Donders, Yvonne, 2011.

In this international and national setting, it is possible to argue that one of the many difficulties in the advancement of the right to science is the lack of definition of States' obligations.[13]

At this point, it is meaningful to refer a recent analysis of 202 constitutions, in which it is asserted that the right to science appears in a considerable number of constitutional texts.[14] This important information should not be underestimated. Neither should it be overestimated. The same analysis reveals that an autonomous broad right to science is not usually nominated, neither its positive aspects are formulated. Most of the existing provisions guarantee the freedom of science. Numerous others convey obligations to foster and fund scientific research. Provisions explicitly warranting the positive aspects of enjoying the benefits of scientific progress and its applications are still rare. On top of this, the analysis unveils that constitutional jurisprudence on the right to science is extremely limited.

The recent COVID-19 pandemic turned the importance of the right to science undeniable. The possibilities of the right to science should not stay unexplored; there is an urgent need to delve into its full-fledged recognition and advancement.

In this context and bearing in mind the central role of science and technology in our kaleidoscopic world, it seems decisive to keep the focus on the right to science and its advancement.

The present article aims to anchor an implicit broad right to science in a specific constitutional order and to explore its concretization through domestic constitutional practice. The elaborations developed in a particular domestic context can offer input for the development of the right either in other domestic orders or in the international arena. The background of this goal is the reciprocal influence between national and international law on human rights.[15]

The article is organized as follows. The first section offers an overview of the legal foundations of the right to science in the Brazilian constitutional system, chosen as the domestic scenario for the investigation. The second section delves into the Brazilian constitutional practice. The ensemble of decisions taken by the Federal Supreme Court («Supremo Tribunal Federal» – STF) is scrutinized to identify the institutional recognition of the implicit right to science. Having these decisions as starting point, the next section advances substantial elaboration on

13 Certainly, other hindrances specially related to economic interests impact the right to science, as explained in Marks, Stephen P., 2012.

14 For this interesting and necessary analysis, see Romano, Cesare P. R.; Boggio, Andrea, 2020.

15 For an interesting attempt to capture and analyze this interplay between international and national framework, in an interdisciplinary approach to the right to science and the rights of science, see Boggio, Andrea *et alii*, 2020.

the content of the right to science as an autonomous right[16] focussing on the state core obligations. At the end, some closing remarks are presented as well as further research paths are indicated.

2. Setting a concrete domestic scenario – the openness of the Brazilian rights system and the recognition of the right to science

The REBSPA is not enshrined in the Brazilian constitution as an explicit autonomous fundamental right; it is not a directly established constitutional norm.[17] Nevertheless, it is possible to assert that the REBSPA makes part of this domestic legal order, and to ground this assertion.

It is reasonable to affirm that the Brazilian constitutional enumeration of fundamental rights is nor complete or immutable. The protection claimed by human dignity requires the constitutional rights system to be open and capable of evolution.[18] This conception of an open fundamental rights system unfolds in three main ways,[19] which will be briefly mentioned.

The first way in which openness can be identified is the structural openness which derives from language and leads to law's open texture. The legal norm is not a given to be found or discovered but to be construed from the text of the legal provision and from the other systemic legal elements. The legal norm is construed through interpretation, which relies upon rational argumentative processes to support the meaning defended.[20] Interpretation reveals the probable and possible meanings which should be justifiable within the textual and systemic boundaries.[21] This structural openness has paramount importance in the Brazilian constitutional setting because fundamental rights provisions deserved an open wording and are accompanied by plenty of general clauses referring human dignity, equality and sociality. Moreover, there are various provisions establishing

16 On the importance of an autonomous right to science see Smith, Tara, 2020.

17 Alexander Hudson refers the *Comparative Constitutionals Project* and affirms that 21 constitutions enshrine the right to science, while 133 mention science or research. See Hudson, Alexander, 2020.

18 For a specific approach on the expansive and evolutive potential of human dignity, see Finck, Michèle, 2016.

19 For a deeper development on the open conception of the rights system, see Netto, Luísa, 2021.

20 For a similar approach to interpretation, especially concerning international law, Venzke, Ingo, 2013; Venzke, Ingo, 2018.

21 On textual limits, among others, see Schauer, Frederick, 2012.

state's obligations which could lead to subjectivation.[22] Profiting from this structural openness, implicit rights can be brought to light through interpretation.[23]

The second way to affirm the openness of the constitutional rights system is to identify an implicit principle which commands state powers to constantly update the system to guarantee full respect to human dignity through evolving historical circumstances. This implicit constitutional principle can be anchored in provisions which establish explicit open clauses for «new» rights, as, for example, Article 5, paragraphs 2 and 3 of the Brazilian constitution.[24]

Finally, the openness of rights system can be regarded as an imposition of international law. Christina Eckes explains that human rights constitute a special case in the interaction between different legal spheres.[25] The traditional reserved state domain suffers an erosion when it comes to rights; beyond the field of autonomous commitments, there is a growing set of *jus cogens* norms which imposes itself heteronomously.[26] In addition, international law conveys substantial new fundamental content to the rights system through self-commitment. As many constitutions, the Brazilian one disciplines the integration of international norms within the domestic legal order. Article 5, paragraph 3, carries a specific provision which establishes the reception of international human rights norms.[27]

An exploring endeavour through this open conception of the Brazilian rights system, here briefly presented, can be developed through a concrete example: seeking to identify normative elements to sustain an implicit right to science.

The starting point of this endeavour is the structural openness, which enables to expand rights through interpretation. Despite the lack of an explicit

22 See some concrete provisions of the Brazilian constitution: human dignity is found in the preamble, in Articles 1, 226 and 230; equality (prohibition towards unjustified discrimination, obligations concerning the eradication of inequalities) is found in the preamble, in Articles 3, 4, 5, 7, 14, 37, 196, 206; sociality (solidarity, welfare obligations) is found in the preamble, in Articles 3, 5, 6, 7, 170, 193, 194, 195, 203, 204, 205, 208.

23 On expanding the right to health through interpretation, see Marks, Stephen P., 2016.

24 CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL DE 1988 [CR/88] Oct. 5, 1988, art. 5, § 2: «*The rights and guarantees expressed in this Constitution do not exclude others deriving from the regime and from the principles adopted by it, or from the inter- national treaties in which the Federative Republic of Brazil is a party.*» Many other constitutions carry similar open clauses, e.g., the ninth amendment to the American constitution and Article 16 of the Portuguese constitution. To gain a different perspective, it is interesting to look at the Australian «partial bill of rights»; see Dixon, Rosalind, 2016.

25 Eckes, Christina, 2019.

26 Kälin, Walter; Künzli, Jörg, 2009. Discussing this problematic from different perspectives, see, among others, Tasioulas, John, 2016; Peters, Anne, 2006; Bianchi, Andrea, 2008; Parker, Karen, 1989; De Wet, Erika, 2006; De Wet, Erika, 2007; De Wet, Erika, 2006; De Wet, Erika, 2004.

27 CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL DE 1988 [CR/88] Oct. 5, 1988, art. 5, § 3: «*International human rights treaties and conventions which are approved in each House of the National Congress, in two rounds of voting, by three fifths of the votes of the respective members shall be equivalent to constitutional amendments.*»

positivation of an autonomous right to science in the Brazilian constitution, the freedom to express and communicate scientific activities is protected among the individual rights and guarantees.[28] From another perspective, within the individual rights and guarantees, the protection of intellectual property is vested. Intellectual property protection frequently comes into tension with the right to science. It is interesting to notice that the provision formulating this protection makes it undeniable that a collective or social dimension must be respected. This social dimension may be regarded as another legal vestige of the right to enjoy the benefits of scientific progress.[29] In addition, there are constitutional determinations concerning science[30] which can be gathered around the idea of a defensive right against the misuse of science.[31]

Beyond the individual rights chapter, scientific autonomy is constitutionally stated in favour of universities.[32] Besides, there are specific provisions regarding science which elucidate its recognition in the legal order, especially by imposing various obligations on the state to foster scientific progress.[33] These obligations

28 CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL DE 1988 [CR/88] Oct. 5, 1988, art. 5, IX: *«the expression of intellectual, artistic, scientific, and communications activities is free, independently of censorship or license.»*

29 CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL DE 1988 [CR/88] Oct. 5, 1988, art. 5, XXIX: *«the law shall ensure the authors of industrial inventions of a temporary privilege for their use, as well as protection of industrial creations, property of trademarks, names of companies and other distinctive signs, viewing the social interest and the technological and economic development of the country;»*

30 CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL DE 1988 [CR/88] Oct. 5, 1988, art. 15, I: *«Freedom from torture or cruel, inhuman or degrading treatment or punishment 1. No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment. In particular, no one shall be subjected without his or her free consent to medical or scientific experimentation.»*

31 Donders, Yvonne, 2015.

32 CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL DE 1988 [CR/88] Oct. 5, 1988, art. 207: *«The universities shall have didactic, scientific, administrative, financial and property management autonomy and shall comply with the principle of nondissociation of teaching, research and extension. (EC no. 11, 1996). § 1. the universities are permitted to hire foreign professors, technicians and scientists as provided by law. § 2. The provisions of this article apply to scientific and technological research institutions.»*

33 CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL DE 1988 [CR/88] Oct. 5, 1988, art. 200: *«It is incumbent upon the unified health system, in addition to other duties, as set forth by the law: (…) v – to foster, within its scope of action, scientific and technological development.» Id.,* art. 214: *«The law shall establish a ten-year national education plan, with a view to organizing the national education system with the cooperation of States and Municipalities, as well as to defining implementation directives, objectives, targets, and strategies so as to ensure maintenance and development of teaching, at its various levels, grades, and modalities, by means of integrated federal, state, and municipal government actions leading to: (EC No. 59, 2009) I – eradication of illiteracy; II – universalization of school assistance; III – improvement of the quality of education; IV – professional training; V – humanistic, scientific and technological advancement of the country; VI – stipulation of an amount of public funds to be invested in education as a proportion of the gross domestic product.» Id., art. 216: «The Brazilian cultural heritage consists of the assets of a material and immaterial nature, taken individually or as a whole, which bear reference to the identity, action and memory of the various groups that form the Brazilian society, therein included: (EC No. 42, 2003) I – forms of expression; II – ways of creating, making and living; III – scientific, artistic and technological creations; IV – works, objects, documents, buildings and other spaces intended for artistic and cultural expressions;*

often connect scientific progress with constitutionally assigned goals.[34] Articles 218 and 219 are particularly important in this regard.[35] Moreover, the careful enumeration of state's obligations can enable to subjectivize some individual positions related to science and scientific progress. Possible subjectivation starting points can be found, for example, in Article 218, paragraph 3 of the Brazilian constitution.

In a federal state, the constitutional distribution of powers among the federal spheres is a central issue. Hence, to complete the constitutional scenario on science it is necessary to scrutinize the competence granting norms. Interestingly, amidst these norms there is a provision upon which a broad right to science can be grounded:

> «Article 23. The Union, the States, the Federal District and the Municipalities, in common, have the power: (CA No. 53, 2006) (…)
>
> V – to provide the means of access to culture, education and science; (…).»

This provision has a crucial role in anchoring a broad right to science in the Brazilian legal order. It must be combined with the other constitutional norms on legislative and administrative competences in order to clarify the «power» pertaining to each federal level. It is meaningful to note that, in the constitutional

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V – urban complexes and sites of historical, natural, artistic, archaeological, paleontological, ecological and scientific value.»

34 CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL DE 1988 [CR/88] Oct. 5, 1988, art. 226: *«The family, which is the foundation of society, shall enjoy special protection from the state (…) § 7. Based on the principles of human dignity and responsible parenthood, family planning is a free choice of the couple, it being within the competence of the State to provide educational and scientific resources for the exercise of this right, any coercion by official or private agencies being forbidden.»*

35 CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL DE 1988 [CR/88] Oct. 5, 1988, art. 218: *«The State shall promote and foster scientific development, research and technological expertise. § 1. Basic scientific research shall receive preferential treatment from the state, with a view to public well-being and the advancement of science. § 2. Technological research shall be directed mainly to the solution of Brazilian problems and to the development of the national and regional productive system. § 3. The state shall support the training of human resources in the areas of science, research and technology and shall offer special work means and conditions to those engaged in such activities. § 4. The law shall support and foster the companies which invest in research, creation of technology appropriate for the country, training and improvement of their human resources and those which adopt remuneration systems that ensure employees a share of the economic earnings resulting from the productivity of their work, apart from the salary. § 5. The states and the federal district may allocate a share of their budgetary revenues to public entities which foster scientific and technological education and research.» Id.*, art. 219: *«The domestic market is part of the national patrimony and shall be supported with a view to permitting cultural and socio-economic development, the well-being of the population and the technological autonomy of the country, as set forth in a federal law.»*

setting, granting «power» does not simply indicate entitlement, but imposes obligations. To establish «the power to» means to confer a competence with its inseparable obligations to achieve defined goals. The ways to comply with these obligations may depend on further democratic processes and decisions. The extent of the achievement of the goals may also vary. Nonetheless, the use of the power to achieve the goals is unavoidable and, in this case, opens the door to subjectivation. Indeed, the wording of the provision is extremely generous towards a right to science because it formulates the goal of the «power» as «the access to culture, education and science». By stating «the power to provide the means of access to science» this provision carries a clear imposition which enables interpretative expansions towards the subjectivation of derivative rights to science. Obligations and rights may be construed as the two sides of the same coin.

Considering the ensemble of provisions referred, profiting from the structural openness mentioned above and reckoning on legal argumentation, it is viable to present sufficient and adequate rational grounds in favour of a right to science in the Brazilian system. On this argumentative path, not only the explicit constitutional norms briefly indicated can be called upon, but also international norms. The interpretative result defended is that there is a broad implicit fundamental right to science in the Brazilian legal order. It is a right which encompasses various specific subjective positions or derivative rights, with negative and positive contents, for individuals in general and specifically for scientists.[36]

In addition to the structural openness, it is possible to cogitate on the application of the principle of openness sketched above. In the Brazilian constitution this principle is established namely through the explicit open clause which leads to the acceptance of new fundamental content. It is possible to advocate that the right to science derives from the regime and the principles adopted by the constitution – as directly commanded by the Brazilian open clause – and to retrieve its fundamental content in ordinary law provisions. Satisfactory constitutional anchoring has already been indicated. In relation to ordinary law, various Brazilian statutes regulate the field of science and technology and provide significant normative elements to recognize a fundamental right to science.

36 At this moment, the question concerning a collective right to scientific progress, possibly connected to the right to development, will be left open. Moreover, it is important to note that the main focus of the paper are the general rights, not the ones specific held by scientists.

Among a multitude of legislation that could be referred,[37] two federal statutes are central: Federal Law no. 10.973/2004, which disciplines state incentive to innovation, scientific and technological research in a productive setting; and Federal Law no. 13.243/2016, which guides incentive to scientific development, research, scientific capacitation, and innovation. The norms enshrined in these statutes impose numerous obligations on the various governments that constitute the Brazilian federation, namely obligations to foster scientific and technological development and progress. When it comes to a specific right to science, it is essential to deduce from these norms a fundamental subjective content regarding the right of entrepreneurs to profit from incentives and from sharing technological and scientific progress results. Additionally, the Federal Law no. 12.243/2016 describes the state's obligation to promote scientific and technological activities as strategies for economic and social development, which strengthens the justification of a broad right to science. Moreover, other statutes could be named to ground the right to science especially connected to social rights such as education[38], health[39] and culture[40].

In this scenario, the right to science appears in its positive nature, imposing obligations on the State[41] to take action, either legislative or executive. Nonethe-

37 The possible conflicts between the REBSPA and the right to intellectual property, for example, are not subject to consideration in this article. Nonetheless, it is interesting to mention that Brazilian law disciplines these matters. See, for instance, Lei Federal n. 9.279, de 14 de Maio de 1996, DIÁRIO OFICIAL DA UNIÃO [DOU] de 15.5.1996; Lei Federal n. 9.609, de 19 de Fevereiro de 1998, DIÁRIO OFICIAL DA UNIÃO [DOU] de 20.2.1998 & 25.2.1998; and Lei Federal n. 9.610, de 19 de Fevereiro de 1998, DIÁRIO OFICIAL DA UNIÃO [DOU] de 20.2.1988.

38 See Lei Federal n. 9.394, de 20 de Dezembro de 1996, DIÁRIO OFICIAL DA UNIÃO [DOU] de 23.12.1996.

39 Regarding the right to health in Brazilian ordinary law, it is important to refer Lei Federal n. 8.080, de 19 de Setembro de 1990, DIÁRIO OFICIAL DA UNIÃO [DOU] de 20.9.1990, which carries provisions concerning «therapeutical assistance and incorporation of technology in health». A special organ was created in the federal public administration to take care of this incorporation, it is the «Comissão Nacional de Incorporação de Tecnologias em Saúde do Ministério da Saúde (Conitec)» (Ministry of Health National Commission for the Incorporation of Technologies in Health). On this subject, see Lima, Sandra Gonçalves Gomes *et alii*, 2019.

40 In Lei Federal n. 12.343, de 2 de Dezembro de 2010, DIÁRIO OFICIAL DA UNIÃO [DOU] de 3.12.2010, which establishes the National Culture Plan, it is possible to find connections between culture and scientific progress. See also the Lei Federal n. 8.313, de 23 de Dezembro de 1991, DIÁRIO OFICIAL DA UNIÃO [DOU] de 24.12.1991.

41 See Lei Federal n. 12.965, de 23 de Abril de 2014, DIÁRIO OFICIAL DA UNIÃO [DOU] de 24.4.2014, which establishes principles, guarantees, rights and duties regarding the use of internet in Brazil. In its Article 4, the goals of the legal discipline are set: access to information, knowledge and participation in cultural life and public matters conduction.

less, it is also possible to retrieve protective normative provisions approaching the right to science from its negative perspective. In 2005, for example, the statute on biosecurity was enacted (Federal Law no. 11.105/2005), bringing to light heated discussions on the use of stem cells.[42]

The ensemble of provisions indicated offer plentiful normative anchoring for the recognition of a right to science through the Brazilian open clause.

The third manifestation of the open conception of the Brazilian rights system regards the confluence between national and international law. To this point, as mentioned, the Brazilian constitution contains a specific open clause to international law, which becomes intertwined with the general open clause and welcomes international norms on human rights. In the first place, it is possible to consider international law-binding instruments through self-vinculation. In the Brazilian case, it is especially important to refer the International Covenant on Economic, Social and Cultural Rights and the American Convention on Human Rights. Besides, it is possible to cogitate on a bundle of norms with *jus cogens* nature, namely the Universal Declaration of Human Rights.[43] These international instruments convey provisions establishing a right to science. Relying on the binding international norms and considering the Brazilian open clauses, the argumentation in favour of a right to science is certainly strengthened.

These considerations lead to conclude that, despite not being explicitly enumerated in the Brazilian constitution, the REBSPA is an element of the Brazilian fundamental rights system. Its recognition is grounded on interpretation, on the open clause and on binding international norms.

Nonetheless, for the advancement of the right to science as an autonomous broad right, it is necessary to elaborate specific subjective positions which can be reconducted into its broad spectrum. This elaboration is relevant to clarify the state's obligations imposed by the right to science. Moreover, in the Brazilian institutional scenario, it is essential to inquire whether these theoretical cogitations and assumptions can find resonance in jurisdictional decisions of the Constitutional Court.[44] This is the official instance, within the democratic constitutional system, where possible legal interpretations do (or do not) gain institutional legitimate recognition.

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42 STF, ADI 3.510 / DF, Relator: Min. Carlos Ayres Britto, 29.05.2008, 96, Diário do Judiciário Eletrônico [DJe], 28.05.2010, 13, available at: http://redir.stf.jus.br/paginadorpub/paginador.jsp?docTP=AC&docID=611723.

43 See Mann, Sebastian Porsdam *et alii,* 2020.

44 The Brazilian highest Court, called *Supremo Tribunal Federal* (Federal Supreme Court), exercises constitutional review competences. For this reason, it is referred in this paper as Brazilian Constitutional Court. Nonetheless, this court has a specific nature, exercising many other jurisdictional tasks not commonly assigned to Constitutional Courts. For an approach on its competences and powers, see the CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL DE 1988 [CR/88] Oct. 5, 1988, art. 101 and following.

3. The right to science in the decisions of the Brazilian Constitutional Court

In the ensemble of the decisions taken by the Brazilian Constitutional Court there is no explicit mention of a specific REBSPA. Notwithstanding, it is possible to find various rulings which refer science and legally lean on it to strengthen or ground fundamental content.

Before delving into the case law, some brief methodological notes are necessary. The search among the decisions was made on the official website of the Court.[45] Considering the necessity of delimitating the present analysis, only its collegiate decisions were scrutinized, leaving aside monocratic rulings. Moreover, since the paper is centred in constitutional questions, the search was circumscribed to decisions taken by the Federal Supreme Court exercising constitutional review competences. It is crucial to notice that the exercise of these competences is limited by various processual mechanisms which filter the access to constitutional review. Because of these mechanisms, many judgments deal with processual requirements, not leading to further substantial legal analysis.[46]

From another perspective, it is meaningful to register that the goal of the analysis was not to carry out an extensive empirical research not either to present statistic data. A preliminary search was done aiming to identify guiding threads which could provide a comprehensive approach to the use of «science» and «scientific progress» in judicial argumentation. Following these threads, the terms used in the search engine were «scientific progress», «right to science», «science and health», «scientific and health», «medicines and science», «medicines and scientific», «medicines», «ANVISA» (Brazilian Health Regulatory Agency), «HIV», «AIDS», «pesticides», «Article 218». Certainly, further inquiries may reveal other relevant judgements. Here, the leading idea was to gather information from the most illustrative decisions of the Court concerning its use of «science» and «scientific progress» as a legally relevant basis for rights enforcement. This research path ultimately aimed at disclosing the recognition of an implicit right to science in order to provide the interpretation defended above with an institutional anchor.

The analysis of the case law starts with decisions concerning the right to health,[47] which is the right that most appeared in the Constitutional Court rul-

45 See: portal.stf.jus.br.

46 In another opportunity, a broader research within the Federal Courts and especially the Superior Court of Justice decisions should be made and might deliver a wider look at the judicial resort to scientific progress in rights enforcement.

47 On the connection between the right to science and the right to health, see, among others, Marks, Stephen P., 2012; Donders, Yvonne, 2011. On the connection between the right to science and other social

ings in connection with science and scientific progress. Among the decisions on the right to health some recent rulings made in the context of the pandemic are explored. Then, decisions referring the right to education, in a broad sense, are addressed. Finally, judgements approaching other rights and constitutional issues are considered.

The study of case law in Brazil profits from the paramount role played by the judiciary in enforcing rights. Brazil saw a growing judicialization of rights after the advent of a new constitutional order – a democratic one after years of dictatorship –, and as a result of theoretical law developments and evolving practical trends. Ever-increasing demands were brought to the judiciary against the state, mainly regarding actions demanded from the executive branch. Economic, social and cultural rights did not stay out of this development, on the contrary, they steered this phenomenon. The judicialization of the right to health became a fracturing issue for the Brazilian state and society, imposing substantial consequences on public health policies, public budget, and expenditure.

It is essential to explain that, in the Brazilian constitution, the right to health is enshrined in a very general wording provision, which dictates a wide range of obligations on the State.[48] The Unified Health System («SUS – *Sistema Único de Saúde*»), constitutionally structured, is one of the most important pillars of the enforcement of this right in the Brazilian legal and institutional order. This system is responsible for the public health service, which is universally accessible and free of charge.[49] Relying on these constitutional provisions, many lawsuits are filled. Some demands concern legally established government obligations to deliver medicines or treatment, but many others require benefits which are not enshrined in statutes or their regulations.

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rights, see, among others, Smith, Tara, 2020.

48 CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL DE 1988 [CR/88] Oct. 5, 1988, art. 6: *«Education, health, food, work, housing, transportation, leisure, security, social welfare, protection of motherhood and childhood, and assistance to the destitute, are social rights, as set forth by this Constitution.»* (EC 26, 2000; EC 64, 2010; EC 90, 2015). *Id.*, art. 196: *«Health is a right of all and an obligation of the State and shall be guaranteed by means of social and economic policies aimed at reducing the risk of illness and other hazards and at the universal and equal access to actions and services for its promotion, protection and recovery.»* Many other constitutional provisions explicitly approach the right to health itself, as well as federal unities duties and budgetary impositions.

49 CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL DE 1988 [CR/88] Oct. 5, 1988, art. 198: *«Health actions and public services integrate a regionalized and hierarchical network and constitute a single system, organized according to the following directives: (EC 29, 2000; EC 51, 2006; EC 63, 2010; EC 86, 2015) I – decentralization, with a single management in each sphere of government; II – full service, priority being given to preventive activities, without prejudice to assistance services; III – participation of the community. Paragraph 1. The unified health system shall be financed, as set forth in article 195, with funds from the social welfare budget of the Union, the states, the Federal District and the municipalities, as well as from other sources.»*

In the years following the enactment of the constitution, it was possible to find almost any kind of judicial decision on the right to health. Over the years a refinement of the case law concerning the judicialization of health unfolded. The Constitutional Court increasingly began to deny requests of medicines or treatment not explicitly established, arguing on the lack of scientific evidence about the (greater) effectiveness of the medicine or treatment demanded in comparison to what was legally established. Besides, some argumentation on the deference deserved by legislative and executive choices is to be found in this evolving judicial trend.[50]

The importance of these developments to the right to science lies in what follows. In order to turn the constitutional provision on health enforceable, the state branches ought to exercise their various competences. These competences are constitutionally designed and distributed. The legislators are the first legitimate to define priorities and make necessary choices through democratic processes within the vast sea of possibilities which could fall into the broad constitutional provision on the right to health[51] (*prima facie* rights and duties). Legislators hold precedence in paving the way to the realization of the right to health. Their instrument is essentially ordinary law. They establish general norms formulated in legal statutes, which determine general health policies and guide concrete measures considering health, other constitutional goals, budget possibilities and the imposition on equal treatment. By doing so, legislators turn broad constitutional provisions into defined state obligations, they enumerate and guide the regulatory enumeration of specific medical procedures and medicines which must be delivered. To accomplish this task, legislators ought to rely on science and prevailing scientific evidence. To some extent this scientific ground to public decisions is established in legal norms, to some extent it may be delegated to specialized state agencies.

The restrictive development detected above in the Constitutional Court decisions was reinforced in 2019, when it decided on the state obligation to deliver costly (expensive) medicines.[52] The ruling of the case was revisited and made

50 On the deference, especially concerning positive rights, see Klatt, Matthias, 2015.

51 Marks, Stephen P., 2016.

52 The decision was taken following a processual rite within the Court through which it becomes generally binding, i.e., beyond the concrete case decided («*regime de repercussão geral*»). It was stated: «*The plenary of the Court, with the majority of votes, established the following thesis for the general repercussion of the decision: The State cannot be obliged to deliver experimental medicines; The absence of registration in the State Agency forbids, as a general rule, the delivery of medicine by means of judicial decision; It is possible, exceptionally, to impose judicially the delivery of a medicine not registered in the State Agency, if it takes unreasonably long for the Agency to appreciate a pending request (longer period thar established in Federal Law n. Lei 13.411/2016), when these three conditions are fulfilled: The existence of a registration request for the medicine in Brazil, except in the case of orphan drugs for rare diseases and ultra-rare diseases*; *The existence of registration for the medicine in well-known and respected regulatory agencies*

definitive in March 2020. The Court explicitly affirmed that the state is not obliged to deliver costly medicines not explicitly enumerated in legal provisions or regulatory norms and which had not been registered by the Brazilian Health Regulatory Agency («Agência Nacional de Vigilância Sanitária (ANVISA)»). The Court still ought to deliver further legal binding guidance on the matter, since it stated that there could be such an obligation in exceptional cases.[53] Notwithstanding, this ruling fixed a relevant guideline on the subject.

The importance of science and the close relation between scientific progress and health became even more evident when the Court was called to decide on the state obligation (through executive agencies) to revise and update clinical protocols to include new medicines and procedures. In one opportunity, the Court denied the existence of the obligation to include a certain medicine in the regulatory list precisely because the state agency asserted that there was no scientific evidence of the effectiveness of the drug.[54] In this context, the Court acted with deference to legislative and administrative decisions, it respected their competence to address science as grounds to policies and to accommodate the demands on public budget.

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abroad; The inexistence of therapeutical alternative medicines registered in Brazil; The lawsuits that claim the delivery of medicines without registration in Brazil ought to be proposed in face of the Federal Union.» (STF, RE 657.718 / MG, Relator: Min. Marco Aurélio, 22.05.2019, 119, Diário do Judiciário Eletrônico [DJe], 04.06.2019, 63, available at: https://www.stf.jus.br/arquivo/djEletronico/DJE_20190603_119.pdf.). See STF, *Notícias STF: Decisão do STF desobriga Estado de fornecer medicamento sem registro na Anvisa*, PORTAL STF (May 22, 2019), http://portal.stf.jus.br/noticias/verNoticiaDetalhe.asp?idConteudo=411857&ori=1).

53 «The Plenary of the Federal Supreme Court decided this Wednesday (11) that the State (government) is not obliged to deliver costly (highly expensive) medicines requested by means of judicial lawsuits when they are not registered by the National Sanitary Control Agency, unless it is an exceptional situation to be yet defined in the ulterior formulation of the thesis of general repercussion of the decision (Theme 6). The decision, taken in the judgement of the Extraordinary Appeal (RE 566471), affects more than 42 thousand lawsuits on the same theme. The concrete case concerns the State of Rio Grande do Norte denial to deliver sildenafil citrate for the treatment of ischemic cardiomyopathy and pulmonary arterial hypertension of an old poor lady, using the argument of the high cost of the medicine and of the absence of the medicine in the list of medicines included in the state programme of medicine delivery. The patient filled a lawsuit requesting that the State would be condemned to deliver the medicine. The judge from the initial instance determined that the State had to deliver the medicine, and this decision was confirmed in the appeal to the State Court.» (STF, Notícias STF: Estado não é obrigado a fornecer medicamentos de alto custo não registrados na lista do SUS (atualizada), PORTAL STF (Mar. 11, 2020), http://portal.stf.jus.br/noticias/verNoticiaDetalhe.asp?idConteudo=439095&ori=1)

54 Extract of the decision: «Judicial injunction, in public class action, imposed that the Federal Union had to elaborate a new clinical protocol including a medicine not incorporated by the Unified Health System legal framework. The elaboration of a new clinical protocol by the Ministry of Health. Impasse in the incorporation of a medicine. Report of the state organ technically responsible (CONITEC) asserting the absence of scientific evidence of the effectiveness of the medicine and the existence of strong biases in the clinical studies on its use. High cost of its incorporation. Suspension of the injunction determined.» (STF, STP 101 AgR / ES, Relator: Min. Dias Toffoli, 03.10.2019, 277, Diário do Judiciário Eletrônico [DJe], 13.12.2019, 73, available at: https://www.stf.jus.br/arquivo/djEletronico/DJE_20191212_277.pdf).

These briefly referred cases hold space to rephrase the argumentation exposed by the Court and explicitly name the right to science, recognizing its autonomous existence. The right to science can strengthen the right to health and help delimitate it in its broad nature. The right to science imposes grounding in prevailing scientific evidence to support public health policies and concrete measures. In these cases, there was no denial of the enjoyment of scientific progress and its applications because there was no prevailing scientific evidence in favour of the medicine or treatment demanded. Hence, the Court rulings could be rewritten to assert that the state denial of a medicine or medical treatment did not constitute a violation of the right to enjoy the benefits of scientific progress and its applications. Nonetheless, even with no explicit reference to the right to science, these decisions clearly anchor its recognition as an implicit right.

Another question which has received an important decision of the Court, although not yet definitive, concerns a new medicine against cancer, popularly called in Brazil the «cancer pill».[55] Interestingly, the constitutional review of the norms included in the Federal statue which deals with the issue (Law no. 13.269/2016) was proposed by the Brazilian Medical Association (*Associação Médica Brasileira – AMB*). The association argued that the norms were unconstitutional because they authorized the production, commercialization and use of a medicine (*fosfoetanolamina sintética*: synthetic phosphoethanolamine) despite the absence of conclusive medical studies on its by-effects. The conducting assertion throughout the Court's preliminary decision, which suspended the efficacy of the norms, was the absence of concluding scientific studies and results.[56] In fact, the norms attacked allowed the production, commercialization and use of a medicine which, because of the lack of scientific evidence, had not been registered by the state agency. The statute not only permitted the use of the substance, but it also turned this registration unnecessary. Power division between state branches also came up in the case; political decisions took by the legislators were opposed to technically grounded executive decisions (scientifically parametrized administrative discretion). The main issue, however, was the state obligation to protect individuals against inadequate drugs and medical treatments. The Court explicitly affirmed that:

55 STF, *Notícias STF: STF suspende eficácia da lei que autoriza uso da fosfoetanolamina*, PORTAL STF (May 19, 2016), http://portal.stf.jus.br/noticias/verNoticiaDetalhe.asp?idConteudo=317011&ori=1.

56 Extract of the decision: «HEALTH – MEDICINE – ABSENCE OF REGISTRATION. The request to suspend the efficacy of a statue that authorizes the delivery of a specific substance without the necessary registration, bringing risks to the preservation of general health, holds enough relevance.» (STF, ADI 5.501 MC / DF, Relator: Min. Marco Aurélio, 19.05.2016, 168, Diário do Judiciário Eletrônico [DJe], 01.08.2017, 123, available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=312214682&ext=.pdf).

> «the right to health will not be entirely concretized without the fulfilment by the state of its obligation to guarantee the quality of the medicines delivered to individuals through rigorous scientific control …»
>
> «The obligation to deliver medicines to population can become in tension with the constitutional obligation to guarantee the quality and safety of the products that circulate in the national territory, i.e., the safeguard role of public power prohibiting the access of population to some substances. The hope held by the population regarding medicines, especially those aimed at treating diseases as cancer, cannot be parted from science. The time for chasing healing without the correspondent care for safety and efficacy of the substances used is gone. The right to health will not be full-fledged concretized without the fulfilment by the state of its obligation of guarantying the quality of the medicines delivered to individuals by means of rigorous scientific control, able to prevent disillusions and charlatanism and negative effects on human beings.»[57]

Once more, in this ruling there was no explicit naming of a right to enjoy the benefits of scientific progress and its applications. Nonetheless, the axial argumentation that sustains the decision taken by the Constitutional Court was the interrelation of a subjective advantage position connected to science and the right to health. Science is called upon to ground a positive right to adequate medicine delivery and medical treatment. Science is also called upon to anchor a negative protective right which demands the state to prevent the production and free use of substances without conclusive scientific evidence. Besides, science and its progress also impose an obligation on state to foster scientific research to protect and promote health. It seems possible, according to the purpose of this paper, to argue that these objective dimensions – state obligations – can be subjectivized to a certain extent, leading to substantial individual positions or derivative rights. When the Court speaks of a violation of the right to health, one could also rephrase it and add a more specific violation of the REBSPA.[58]

57 STF, ADI 5.501 MC / DF, Relator: Min. Marco Aurélio, 19.05.2016, 168, Diário do Judiciário Eletrônico [DJe], 01.08.2017, 123, available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=312214682&ext=.pdf.

58 «Therefore, I understand that there is a violation of the right to health by the authorization of the use of synthetic phosphoethanolamine before the conclusion of all the necessary tests to demonstrated it is safe, i.e., without toxic or negative side-effects to health; and effective, i.e., able to function and attack the disease. Subverting, by law, the procedure of the registration of medicines, in the name of an alleged right of people with cancer to seek healing alternatives, the State is, in fact, exposing these people to serious risks

Indeed, notwithstanding the lack of autonomous reference to the right to science, these first decisions analysed enable to affirm that the Court identifies specific subjective positions towards enjoying the benefits of scientific progress and its applications. Some of these subjective positions are unequivocal in connection to the right to health and appear in the Court's own words, e.g.:

> «In such a relevant theme, which involves people fragilized by illness and seriously longing for healing, there is no room for speculation. In the absence of scientific information and knowledge on possible adverse effects of a substance, the solution can never be the permission of its use. On the contrary, it should be the fostering of scientific research, testing and protocols, able to guarantee protection to the people who want to use these medicines. This is a basic consequence of the principle of precaution, which guides the activity of sanitary registration and control, being grounded on the right to safety (Article 5 of the Constitution).»[59]

By asserting, in the excerpt above, that «this is a basic consequence of the right to science», the Court would not deviate from its own rationale, rather reassure it.

Following a similar path, the Constitutional Court decided a demand on the constitutional review of norms disciplining the importation of tobacco products and the powers of the Brazilian Health Regulatory Agency.[60] It is assumed that the agency receives from statutory norms the regulatory competence to discipline and control the production, importation, and commercialization of tobacco products. This is a technical competence, grounded on administrative decentralization and specialization. The agency exercises technical discretion which cannot be identified with political discretion.[61] It regulates the subject in the space provided by legislation and decides based on scientific prevailing evidence. In

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exactly to the goods it pursued to protect: life, dignity, integrity, health.» (STF, ADI 5.501 MC / DF, Relator: Min. Marco Aurélio, 19.05.2016, 168, Diário do Judiciário Eletrônico [DJe], 01.08.2017, 123, available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=312214682&ext=.pdf).

59 STF, ADI 5.501 MC / DF, Relator: Min. Marco Aurélio, 19.05.2016, 168, Diário do Judiciário Eletrônico [DJe], 01.08.2017, 123, available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=312214682&ext=.pdf.

60 STF, *Notícias STF: Plenário do STF retoma à tarde o julgamento da ação sobre cigarros aromatizados*, PORTAL STF (Fev. 2, 2018), http://portal.stf.jus.br/noticias/verNoticiaDetalhe.asp?idConteudo=368275&ori=1.

61 See Lei Federal n. 9.782, de 26 de Janeiro de 1999, DIÁRIO OFICIAL DA UNIÃO [DOU] de 27.1.1999, especially art. 8, which states that the agency has the power to decide, on grounds of technical criteria, which ingredients can be legally used in tobacco products. The expression *technical* here clearly points to the use of scientific knowledge about tobacco and its effects on health.

this case, according to the Constitutional Court, the impositions advanced by the agency could be reasonably justified considering its duty to reconcile market interests with the right to health[62] (the right to information) and other constitutionally protected values and goals. Interestingly, from another perspective, the Court quoted the World Health Organization Framework Convention on Tobacco Control (WHO/FCTC),[63] which explicitly reckons on scientific evidence[64] and scientific progress.[65] The Court stated that *«the incorporation of the convention in domestic law, although non-binding, provides a* standard *of reasonability for creating parameters»*.

Another relevant issue faced by the Constitutional Court regards the production and use of asbestos. Many statutes were declared void because of unconstitutionality, as they did not observe the prohibition to use asbestos. In the various decisions taken on this matter, the Court generally asserted that factual circumstances had changed as soon as scientific progress and evidence made it irrefutable that the production and use of asbestos have harmful consequences on the environment and health. Scientific advancement was taken as the factual foundation to declare legal norms void according to constitutional provisions. In the argumentation that justifies the judgements, the right to health was called upon (as well as the necessary protection of the environment) in association with scientific progress. The Court stated that, when science renders new evidence with impact on health, a claim for protection is born. In some cases, in order to justify the protection of workers' health, the Court referred the International Labour Organization Convention no. 162 and asserted that legislation must be updated in the face of technical development and scientific progress.[66]

62 On a derivative right to tobacco control, see Dresler, Carolyn; Marks, Stephen P., 2006.

63 World Health Organization [W.H.O.], *WHO Framework Convention on Tobacco Control*, 2003.

64 It is possible to read in its preamble: *«Recognizing* that scientific evidence has unequivocally established that tobacco consumption and exposure to tobacco smoke cause death, disease and disability, and that there is a time lag between the exposure to smoking and the other uses of tobacco products and the onset of tobacco-related diseases. *Acknowledging* that there is clear scientific evidence that prenatal exposure to tobacco smoke causes adverse health and developmental conditions for children.» And then, in its Article 8: *«Protection from exposure to tobacco smoke.* 1. Parties recognize that scientific evidence has unequivocally established that exposure to tobacco smoke causes death, disease and disability.»

65 When disciplining scientific and technical cooperation and communication of information, it states in its Article 20: «…initiate and cooperate in, directly or through competent international and regional intergovernmental organizations and other bodies, the conduct of research and scientific assessments, and in so doing promote and encourage research that addresses the determinants and consequences of tobacco consumption and exposure to tobacco smoke as well as research for identification of alternative crops.»

66 STF, ADI 4.066 / DF, Relatora: Min. Rosa Weber, 24.08.2017, 43, Diário do Judiciário Eletrônico [DJe], 07.03.2018, 97, available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=313831911&ext=.pdf. See STF, *Notícias STF: Plenário conclui julgamento de ADI contra lei federal que permite uso de amianto crisotila*, PORTAL STF (24.08.2017), http://portal.stf.jus.br/noticias/verNoticiaDetalhe.asp?idConteudo=353578&ori=1.

Recently, in an important preliminary ruling, the Court rendered a ministerial act void. The act established a tacit permission to produce, commercialize and use pesticides in case the state agency did not accomplish the analysis of the register within procedural deadlines. Under these circumstances, the production and use of the pesticides would be tacitly allowed, regardless of a study or control on their potential harmful effects. Precaution as a state legal obligation was connected to scientific evidence and used to ground the decision, aiming to protect the right to health[67] and the environment.[68]

A sensitive and fracturing question for Brazilian society was addressed by the Constitutional Court when analysing the criminal provision on abortion.[69] The issue faced by the Court was whether abortion should not be considered a crime in case of proved anencephaly. Within this framework, in a very lengthy decision, scientific progress was frequently called upon to ground the assertion that there should be a right for women to choose for abortion when science provides certainty that the foetus is not viable. Scientific progress was also evoked to affirm the protection of women's physical and psychological health in such conditions. Besides, scientific progress, knowledge and evidence were used to explain that the foetus suffering from anencephaly has no conscience, what was another reason in favour of the right to choose for an abortion. The judgment approached many complex questions, such as the role and the language of science, the role of state powers in the face of scientific knowledge, the legal moment of the initiation of human life. Eventually, the Court decided to decriminalize abortion in case of foetus suffering from anencephaly. Science and scientific progress were taken as a pillar to the decision, as this small excerpt shows it:

> «… the importance of medicine which assists the patient, in the pursue of human health, the evolution of the medical knowledge, with even more precise and exact diagnosis, cannot be denied; the Judiciary cannot disregard that the scientific and technological development are the means to improve life conditions and guarantee health.»[70]

67 It is possible to cogitate on a connection between the right to food (as an autonomous right or a derivative right of the right to health) and the right to science. See, among others, Marks, Stephen P., 2012.

68 STF, ADPF 656 MC / DF, Relator: Min. Ricardo Lewandowski, 01.04.2020, 82, Diário do Judiciário Eletrônico [DJe], 03.04.2020, 78, available at: http://www.stf.jus.br/arquivo/cms/noticiaNoticiaStf/anexo/ADPF656liminar.pdf.

69 STF, ADPF 54 / DF, Relator: Min. Marco Aurélio, 12.04.2012, 80, Diário do Judiciário Eletrônico [DJe], 30.04.2013, 19, available at: http://redir.stf.jus.br/paginadorpub/paginador.jsp?docTP=TP&docID=3707334.

70 STF, ADPF 54 / DF, Relator: Min. Marco Aurélio, 12.04.2012, 80, Diário do Judiciário Eletrônico [DJe], 30.04.2013, 19, available at: http://redir.stf.jus.br/paginadorpub/paginador.jsp?docTP=TP&do-

Still with a strong connection to the right to health, the Constitutional Court decided on the constitutionality of norms established by the statute on biosecurity (Federal Law no. 11.105/2005 – *«Lei de Biossegurança»*). This decision combined an active direction, aiming to promote health, with a defensive path towards protecting scientific freedom. The Court considered that the legal norms which allow the use of stem cells in scientific research with medical therapeutic goals are in accordance with the protected fundamental rights. These following words, explicitly formulated by the Court, reveal a crystal clear recognition that the Constitution guarantees subjective advantage positions related to science and scientific progress:

> «… the biosecurity statute is an instrument of the encounter of the right to health with science. In the case, medical and biological sciences, are directly put by the Constitution to serve this inestimable individual good which is his or her own physical and mental wellbeing.»[71]

This judgement carries many relevant aspects for the theme of this paper, but its paramount meaning relates to scientific freedom as a constitutionally protected fundamental content. The Court was quite unequivocal about signalling the recognition of the right to science as warranting scientific freedom and manifestation. Interestingly, this freedom was not stated regarding scientists in particular, but deserved protection as means of guaranteeing the development of science and the access to the results of scientific progress. The Court also related this freedom to state obligations to foster scientific progress and protect the individual and the community against an inadequate use of science and the misconduct of scientific research. Moreover, the Court recalled of human dignity in the decision, concerning both positive and protective aspects of the question.[72]

In the context of the pandemic, the Constitutional Court was more than once challenged and clearly relied on science to decide various cases related to COVID-19.[73] In the absence of a federal strategy to combat the spreading of the virus, the Court reaffirmed states' and municipalities' competence to protect the

cID=3707334.

71 STF, ADI 3.510 / DF, Relator: Min. Carlos Ayres Britto, 29.05.2008, 96, Diário do Judiciário Eletrônico [DJe], 28.05.2010, 13, available at: https://www.stf.jus.br/arquivo/djEletronico/DJE_20100527_096.pdf.

72 STF, ADI 3.510 / DF, Relator: Min. Carlos Ayres Britto, 29.05.2008, 96, Diário do Judiciário Eletrônico [DJe], 28.05.2010, 13, available at: https://www.stf.jus.br/arquivo/djEletronico/DJE_20100527_096.pdf.

73 The case law on COVID-19 was translated to English and is available at: https://www.stf.jus.br/arquivo/cms/publicacaoPublicacaoTematica/anexo/case_law_compilation_covid19.pdf.

right to health according to scientific evidence.[74] In another case, since the federal government started an official campaign against social distancing («O Brasil não pode parar» – Brazil cannot stop), the Court forbid the campaign grounding its decision on the *«almost complete technic-scientific unanimity in favour of social distancing measures»*.[75] In addition, in an important preliminary decision, the Court analysed the presidential decree which created exceptions related to the pandemic and modified the legal regime of liability for public authorities and public servants. In this judgment, the Court concluded that a constitutionally attuned interpretation of the norms was imperative neither to excessively weaken liability nor to hinder public measures imposed by the pandemic. The interpretation asserted rests on the requirement of scientific acceptable grounds to public decisions.[76]

In the reasoning of these recent rulings regarding the pandemic, the central issue concerning science as a parameter for state decisions was clearly addressed. When deciding upon the legitimacy of the publicity campaign developed by the presidency, the Court stated that there was no room for political discretion against scientific prevailing evidence. The Court did not refrain from recognizing the absence of scientific conclusive statements about COVID-19. Nonetheless, science was treated as a parameter for public decisions. Science imposes on authorities the obligation to act in a proportionate way, according to the prevailing scientific evidence available, guided by the principles of precaution and prevention, aiming to take the less risky decisions to protect individuals, public health, and economy. Coherently, the Court stated that public officials are liable when they decide with serious negligence or wilful wrongdoing, violating the rights to life and health and imposing damages on the environment and the economy. The parameters to evaluate serious negligence or wilful wrongdoing is the observance by the technic grounding advice and by the public decision of *«technical-scientific norms and criteria applicable as established by nationally and internationally recognized entities»,* as well as of *«the constitutional principles of precaution and prevention».*[77]

74 STF, ADI 6.341 MC-Ref / DF, Relator: Min. Marco Aurélio, 15.04.2020, 271, Diário do Judiciário Eletrônio [DJe], 13.11.2020, 87, available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=15344964720&ext=.pdf.

75 STF, ADPF 669 MC / DF, Relator: Min. Roberto Barroso, 31.03.2020, 82, Diário do Judiciário Eletrônico [DJe], 03.04.2020, 127, available at: http://www.stf.jus.br/arquivo/cms/noticiaNoticiaStf/anexo/ADPF-669cautelar.pdf.

76 STF, ADI 6.421 MC / DF, Relator: Min. Roberto Barroso, 21.05.2020, 270, Diário do Judiciário Eletrônico [DJe], 12.11.2020, 87, available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=15344951023&ext=.pdf.

77 STF, ADI 6.421 MC / DF, Relator: Min. Roberto Barroso, 21.05.2020, 270, Diário do Judiciário Eletrônico [DJe], 12.11.2020, 87, available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=15344951023&ext=.pdf.\

The right to health certainly provides the most substantial and comprehensive ground to scrutinize the Constitutional Court's argumentation and to advance the recognition of an autonomous right to science. The cases related to the pandemic have enhanced this possibility, as briefly referred above, and might continue to do so. Nonetheless, references to science and scientific progress within a fundamental rights frame can also be found in connection to other rights, such as the right to education.

On one occasion, the Court was called to decide upon the existence of a «subjective public right to home schooling».[78] In this case, the central threads were the right to education and the duties to be carried in solidarity by the state and the family to educate children and teenagers. Even that being the main issue, the Court approached the idea that education is a way of propagating and guaranteeing access to scientific knowledge.[79] In the reasoning of the decision, home-schooling was differentiated from unschooling. The first follows formal educational schemes lead by the family, while the second goes beyond in the direction of abandoning methods and *curriculum* subjects. In defending the first, it was asserted that the family chooses to carry on the schooling task aiming to provide its children and teenagers with adequate «scientific instruction», which is protected within the right to education.[80] Another important issue addressed was the religious or conscience freedom as the basis for a family's choice to educate their children at home, taking them out of the social interaction at schools. Once more, the «access to scientific knowledge» was brought into light as a subjective dimension guaranteed by the right to education.[81]

In this scenario, it would be possible to recall the objective and the subjective dimensions of the fundamental rights, well known in fundamental rights theory. This decision exposes an objective dimension related to the propagation of scientific knowledge, which was presented as a constitutionally guaranteed goal. The right to science, in a subjective dimension, was not explicitly mentioned; the ruling elaborated on the subjective dimensions of the right to education. Nonetheless, there seems to be room to work on the subjectivation of meaningful

78 STF, RE 888.815 RG / RS, Relator: Min. Roberto Barroso, 04.06.2015, 113, Diário do Judiciário Eletrônico [DJe], 15.06.2015, 30, available at: http://redir.stf.jus.br/paginadorpub/paginador.jsp?docTP=TP&docID=8678529.

79 On the access to science through education, see M

80 This is an interesting piece: «The issue here is not, as it would be imaginable, informal or non-curricular education, but, on the contrary, an alternative method of instructing the pupils, using the family as a base to propagate scientific philosophical and cultural knowledge.» (STF, RE 888.815 / RS, Relator: Min. Roberto Barroso, 12.09.2018, 55, Diário do Judiciário Eletrônico [DJe], 21.03.2019, 38, 36 available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=15339756257&ext=.pdf)

81 STF, RE 888.815 / RS, Relator: Min. Roberto Barroso, 12.09.2018, 55, Diário do Judiciário Eletrônico [DJe], 21.03.2019, 38, 36 available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=15339756257&ext=.pdf.

aspects connected to science. Relying on the Court's own words, it is possible to construe a derivative right of access to scientific knowledge connected with the obligation to promote and protect the propagation of this very knowledge:

> «In the same way that the objection of conscience does not legitimate the exclusion of believers and followers of a religion from the social interaction, with its civic duties and the respect to fundamental rights of people that follow other believes, religious or philosophical convictions of a family cannot deny access of pupils to scientific, moral and social knowledge.»[82]

This decision is relevant for the central theme of this paper not only regarding the right to science but also regarding the openness of the fundamental rights system. The Court's argumentation unfolded into testing the substantial fundamentality of a (derivative) right: a specific subjective position (the right to home-schooling) inserted in a broader fundamental right (the right to education). The Court did not rule that there is no «fundamental right to home-schooling»; it denied the existence of a «public subjective right to home schooling».[83] Interestingly, the Court dealt with the «fundamental right to education», but, in the conclusion of the judgment, used the traditional and older concept of «public subjective right». The Court stated that ordinary law can create various public subjective rights within the broad fundamental right enshrined in the Constitution. As there was no legal discipline establishing home-schooling, the Court concluded that there is no such public subjective right.[84]

Still regarding the right to education, the Court was recently challenged to decide on the constitutionality of a state's law that clearly aimed to restrict the freedom to teach and learn.[85] The state's statute was enacted concretizing the scope of a broader social and political movement known as «Escola sem Partido» (School without party), which preconizes the prohibition of any political or

82 STF, RE 888.815 / RS, Relator: Min. Roberto Barroso, 12.09.2018, 55, Diário do Judiciário Eletrônico [DJe], 21.03.2019, 38, 36 available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=15339756257&ext=.pdf.

83 The thesis affirmed was: «Extraordinary appeal denied, with the establishment of the following thesis (Theme 822): 'There is no public subjective right held by the pupil or his/her family to home schooling, inexistent in Brazilian ordinary Law'.»

84 This decision leaves an open question: in the face of the enactment of a statute establishing and disciplining home-schooling, would it be a new fundamental right constitutionally accepted? There is a proposed bill on the subject, not yet approved, Projeto de Lei n. 2.401/2019. The project was presented after the Constitutional Court decision. Available at: https://www.camara.leg.br/proposicoesWeb/fichadetramitacao?idProposicao=2198615.

85 STF, ADI 5.537 / AL, Relator: Min. Roberto Barroso, 24.08.2020, 229, Diário do Judiciário Eletrônico [DJe], 17.09.2020, 41, available at: https://www.stf.jus.br/arquivo/djEletronico/DJE_20200916_229.pdf.

ideological discussions in schools.[86] The Court rendered the norms in the statute unconstitutional. The main discussion was the freedom to teach and learn and the viability of ideological and political restrictions. Science was not the main issue approached. Notwithstanding, the judgement is an important landmark against obscurantism in the design of educational public policies and has clear consequences on the role of science in the effectiveness of the right to education. It was asserted that education entails the freedom to teach, learn, research, and expose thoughts and opinions. In addition, the Court affirmed that the legal framework of education, as constitutionally determined, cannot restrict these freedoms, and must aim, among others, to foster the country's humanistic, scientific, and technological development.

Moving forward on the present analysis, an interesting decision concerning processual aspects was taken by the Court and touched upon relevant aspects of scientific knowledge and development. The central discussion concerned the constitutionality of creating different limits for the salaries of university professors in the various federal states. The discussion was not centred around the individual rights of professors but rather around considerations of equal treatment throughout the country connected with the obligation on states to foster scientific progress through academic activities.[87]

In another case, also starting from a processual issue, the Court stepped into substantial considerations grounded on scientific progress and asserted the application of its outcomes in the benefit of the individuals. The Court decided on the crossroads of the protection offered by *res judicata*, a mechanism of legal security, and the right to personal identity. The decision affirmed the possibility of reopening a decided claim to paternity recognition because of the appearance and availability of DNA tests. An interesting aspect concerns the Court argumentation over the DNA tests and its high costs in the 80s, which made them practically inaccessible. In a systemic interpretation, the Court formulated the need to proceed with the lawsuit on the light of newly available techniques of evidence and affirmed that the appearance of DNA tests was due to scientific progress. In this setting, the argumentation of the Court can be seen as a clear recognition of the right to enjoy the benefits of scientific progress and its applications. This enjoyment trumps *res judicata* and is the means to protect other fundamental contents. Curiously, this judgement raised in the Court the contemplation of a «new fundamental right», the fundamental right to genetic identity. Besides being

86 The «movement» defends the need of an alleged «neutrality» in teaching, but clearly aims at teaching from religious perspectives, with disregard to science. See Guilherme, Alexandre Anselmo; Picoli, Bruno Antonio, 2018.

87 STF, ADI 6.257 / DF, Relator: Min. Gilmar Mendes, 19.11.2019, 255, Diário do Judiciário Eletrônico [DJe], 22.11.2019, 23, available at: https://www.stf.jus.br/arquivo/djEletronico/DJE_20191121_255.pdf.

closely related to human dignity, this right was connected to the enjoyment of scientific progress applications, in the case, the DNA test.[88]

This ruling enables to draw a more general assumption: fundamental subjective positions derived from the right to profit from scientific progress and its applications can be understood as fundamental processual rights. The Court did not use such explicit language, but in its judgement, there was clear argumentation on the protection of adequate scientific and technical means of evidence as subjective guarantees in judicial processes.[89]

Another interesting example of reckoning on science can be found in a decision on public services obligations. The Court asserted it was legal and constitutional to impose the necessary operation updates on the private service provider. This imposition was rooted in scientific and technological progress and its applications aiming at delivering adequate public service. In this case, the right to health and a safe environment were again called upon as well as the precaution principle.[90]

In addition to decisions that rely on science, scientific progress, and its applications to strengthen the content of other fundamental rights, there are various specific references to science in the Constitutional Court case law. Many of them can be read within a «fundamental rights objective dimension» frame, as briefly mentioned above. It is worth to notice that the search through the decisions on the application of Article 218 of the Brazilian constitution reveals several rulings on the constitutionality of federal states' constitutions which determine the destination of a percentage of budgetary resources to fostering scientific activities.[91]

88 STF, RE 363.889 / DF, Relator: Min. Dias Toffoli, 02.06.2011, 236, Diário do Judiciário Eletrônico [DJe], 16.12.2011, 40, available at: http://redir.stf.jus.br/paginadorpub/paginador.jsp?docTP=TP&docID=1638003.

89 STF, RE 363.889 / DF, Relator: Min. Dias Toffoli, 02.06.2011, 236, Diário do Judiciário Eletrônico [DJe], 16.12.2011, 40, available at: http://redir.stf.jus.br/paginadorpub/paginador.jsp?docTP=TP&docID=1638003.

90 See this interesting piece of decision RE 627.189: «1. The issue corresponds to the Theme n. 479 (General repercussion themes of Federal Supreme Court) and regards, in the light of Article 5, caput and number 2, and Article 225 of the Federal Constitution, the possibility, or not, of imposing to the private service provider of electricity, observing the principle of precaution, the obligation to reduce the electromagnetic field of its transmission lines, in accordance with international safety standards, considering possible harmful effects on the populations health. 2. The principle of precaution is a criterion of risk management to be applied when there are scientific uncertainties on the possibility of a product, event or service unbalancing the environment or affecting the citizens health, what requires that the State analyses the risks, evaluate the costs of the prevention measures e, eventually, taking the necessary actions, which should be the result of universal, non-discriminatory, motivated, coherent and proportional decisions.» (STF, RE 627.189 ED-Segundos / SP, Relator: Min. Dias Toffoli, 23.06.2017, 176, Diário do Judiciário Eletrônico [DJe], 10.08.2017, 54, 4 available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=312383009&ext=.pdf).

91 In the Brazilian constitutional and legal order there are several restrictions on determining fixed destination for budgetary resources (see Article 169 of the Brazilian Constitution). There are also powers on the budget legislative initiative that are reserved to the Executive Branch. In this legal scenario the Court had

On the one hand, Article 218 establishes a state obligation to foster scientific development which also entails the federal states. On the other hand, with some exceptions, the federal constitution prohibits the formulation of fixed destinations for budgetary resources; there must be flexibility and freedom to design the public budget accordingly in each financial year. States constitutional provisions which determine the allocation of budgetary resources to foster scientific progress are not considered void by the Constitutional Court. This circumstance reinforces the federal constitutional norm which imposes the obligation to foster scientific progress, guaranteeing the financial means required.

Without pursuing an exhaustive investigation of the decisions taken by the Brazilian Constitutional Court, the present analysis aimed to expose the most pertinent cases in which science and scientific progress were substantively used in the Court's argumentation and deciding process. Even observing that the Court did not explicitly name an autonomous right to enjoy the benefits of scientific progress and its applications, the legal framework and the institutional interpretation rendered by the Court enable the recognition of the right to science within the Brazilian fundamental rights system.

4. State core obligations

The recognition of the right to science within the Brazilian legal order would be strengthened by its accurate identification in judicial rulings. Its clear-cut naming would render the right to science undeniable. Moreover, if the state obligations judicially affirmed were straightforwardly connected to the right to science, they would gain an unequivocal subjective anchor capable of enhancing individual justiciability. Additionally, the recognition of the right to science with specific fundamental content would facilitate revealing its (possible) violations, what could widen the possibilities of reparation and preventive action.

Despite not naming an explicit right to science, the Constitutional Court frequently and recurringly decides relying on science and scientific progress in a fundamental rights' context. Its argumentation exposes a crystal clear individual dimension of enjoying the benefits of scientific progress and its applications,

to decide on several occasions. (STF, ADI 422 / ES, Relator: Min. Luiz Fux, 23.08.2019, 195, Diário do Judiciário Eletrônico [DJe], 09.09.2019, 13, available at: http://portal.stf.jus.br/processos/downloadPeca.asp?id=15341024339&ext=.pdf; STF, *Notícias STF: Plenário virtual julga ADIs contra dispositivos de Constituições estaduais*, PORTAL STF (Sep. 2, 2019, 8:30 PM), http://portal.stf.jus.br/noticias/verNoticiaDetalhe.asp?idConteudo=422338&ori=1; STF, *Notícias STF: Dispositivos da Constituição do RJ sobre recursos para educação são inconstitucionais*, PORTAL STF (Oct. 30, 2014, 6:15 PM), http://portal.stf.jus.br/noticias/verNoticiaDetalhe.asp?idConteudo=278655&ori=1; STF, *Notícias STF: Declarados inconstitucionais dispositivos da Constituição do Estado de Sergipe*, PORTAL STF (Fev. 10, 2010, 8:53 PM), http://portal.stf.jus.br/noticias/verNoticiaDetalhe.asp?idConteudo=120015&ori=1).

including both material and cultural or immaterial benefits. This should not be underrated. The scrutiny of the case law paves the way for rooting state obligations with positive and negative dimensions, as follows:

> (i) State must promote and foster scientific research and development through the democratic design and implementation of public policies,[92] destination of public resources[93] and incentives, creation and maintenance of an adequate institutional setting (universities, research institutes, museums, state agencies with fostering and regulatory tasks);
>
> (ii) State must promote, respect and protect the equal access and enjoyment of scientific progress and its applications – on legal and concrete level;
>
> (iii) State must promote, respect and protect the equal participation in the development, conservation and diffusion of science, scientific and technological research and knowledge;
>
> (iv) State must design and enact its public policies according to prevailing scientific evidence, respecting the precaution duty and assuring transparency on the scientific grounds to public decisions;[94]
>
> (v) State must promote, respect and protect – through its three branches – the effectiveness of fundamental rights and other constitutionally guaranteed goods according to science and prevailing scientific evidence;
>
> (vi) State must design and implement the delivery of public services and utilities accordingly to scientific and technological development and aiming at equal and universal access;
>
> (vii) State must provide legal and concrete protection against the misconduct of science and its unlawful applications;[95]
>
> (viii) State must provide scientists with legal and concrete protection to the product of their work, providing, at the same time, means to the general access and enjoyment of the applications of scientific and technological progress;

92 On the importance of connecting the right to science and its obligations with policy making, see Mann, Sebastian Porsdam *et alii,* 2020.

93 On the obligations concerning research funding, see Mann, Sebastian Porsdam; Schmid, Maximillian M., 2018.

94 Using the decisions above scrutinized as starting point, it is possible to infer the wide scope of this obligation, it can unfold from the design of legislation on production and commercialization of varied goods to legislation regarding processual rights and access to make proof profiting to scientific progress.

95 Donders, Yvonne, 2015.

(ix) State is forbidden to hinder scientific research and progress based on unconstitutional reasons (must respect and protect scientific freedom);

(x) State is forbidden to act in denial or clearly against prevailing scientific evidence (must use discretion within scientific acceptable parameters);

(xi) State must guarantee the access to effective legal remedies in case of violation of the right to science.

The general obligations drafted make it possible to spot some specific obligations related to other autonomous fundamental rights, namely:

(a) Right to health:

(i) State must design and implement public health policies aiming to promote, protect and respect the equal access and enjoyment of scientific progress and its applications related to the right to health and its effectiveness;

(ii) State must comply with its obligations regarding the effectiveness of the right to health according to prevailing scientific evidence;

(iii) State must assure transparency, respecting individual and collective dimensions of a right to information, concerning the scientific grounds to public general policies and to concrete individual situations regarding the right to health;

(iv) State must promote, respect and protect the right to health, through the enactment and implementation of adequate legal and regulatory framework, against the production of medicines or the performance of medical procedures in discordance with prevailing scientific evidence;

(v) State must promote, respect and protect the right to health, through the enactment and implementation of adequate legal and regulatory framework, disciplining, among others, work conditions, food production and commercialization, environment protection;

(vi) State must implement and enforce the legal framework enacted aiming at the effectiveness of the right to health in accordance with science, scientific progress and its applications;

(vii) State is forbidden to design and implement public health policies disregarding prevailing scientific evidence;

(b) Right to education:

(i) State must design and implement educational policies and framework aiming to promote, respect and protect the general and equal access to education, enabling access to scientific knowledge;

(ii) State must promote, respect and protect, through the design and implementation of the educational policy, the conservation, development and diffusion of science and scientific knowledge;

(iii) State must promote, respect and protect the right to education, which entails the freedom to teach, learn, research and expose opinions, including scientific results;

(iv) State must establish the educational public policy and system to foster humanistic, scientific and technological development.

The aim of this present enumeration is not to be exhaustive but to extract concrete foundations from the judicial decisions for the autonomous content of the right to science. On the one hand, the case law examined offers clear legal ground to the state obligations pointed out. On the other, the judicial reasoning can borrow important contributions from scholarly elaborations. On this path, it is desirable that the Courts start naming the right to science connected with these obligations in order to stress their subjective element, which enhances justiciability and, consequently, effectiveness.

Placing these clarifications presented within a broader framework, their implementation must focus simultaneously on the conservation, development and diffusion of science and scientific knowledge.[96] Another important aspect to deserve further development concerns the guarantee of participation and contribution to science;[97] state must warrantee participation in the formulation of policies as well as in the free development of science itself. Additionally, the state obligation to protect the right regarding non-state actors, subtly presented in some of the Courts reasonings, is key to the effectiveness of the right to science.

It is also important to mention that the implementation of the obligations sketched ought to comply with the general principles of progressive realization and avoidance of retrogressive measures, established by international law in the field of social rights. Finally, the implementation of the right to science cannot be separated from the idea of a universal protection of human dignity.[98]

96 United Nations Educational, Scientific and Cultural Organization [UNESCO], 2017; United Nations, Econ. & Soc. Council, Comm. on Economic, Social and Cultural Rights, 2020.

97 This participation aspect which integrates the right to science also raises the question about traditional knowledges. See Morgera, Elisa, 2015. See also Coomans, Fons, 2018.

98 Mann, Sebastian P. *et alii,* 2020.

5. Closing remarks

The openness of the fundamental rights system, required to respond to the renewed challenges faced by human dignity, was briefly presented. Openness is threefold: structural, commanded by an unwritten principle, and imposed by international law. Implicit and new rights can be construed and integrated into the rights system due to its open character. Taking this construction as a starting point, the right to science was recognized as part of the Brazilian fundamental rights system. It is an autonomous right, explicitly anchored in international law norms, as well as in implicitly referred in domestic constitutional and statutory provisions.

This theoretical argumentation gained institutional support through the analysis of several decisions taken by the Brazilian Constitutional Court, in which the right to science is implicitly mentioned. These rulings evidently affirm the individual or subjective legal relevance of science and expose its strong connections with human dignity and other fundamental rights.

The decisions scrutinized offered meaningful elements to elaborate on the state obligations imposed by the right to science and may contribute to its full-fledged normative development. On the one hand, this development may start by dealing with the right to science in connection with other fundamental rights, namely economic, social and cultural rights, as explained with the examples concerning health and education. On the other hand, it is also expected that an autonomous naming, application, and advancement of the right to science will be achieved. In fact, the right to science reinforces the necessity for an integral and interrelated conception of rights without disregarding the importance of specific rights.

The recognition of an autonomous REBSPA will certainly involve a multitude of new potentialities. Enjoying the applications of scientific progress is essential to the access to information and communicational technologies and means,[99] which are increasingly decisive to enable informed participation in democratic processes[100] and public services. The right to science might also be significant to deal with transparency and equal treatment demands posed by the growing use by governments of artificial intelligence, algorithms, and digitalization. From another perspective, controversial questions concerning the ethical boundaries of scientific research and technological facilities may also profit from a rights-based approach with contributions from the right to science.[101] Furthermore, substantial elabora-

99 Marks, Stephen P., 2012.

100 Mann, Sebastian P. *et alii,* 2020.

101 Boggio, Andrea *et alii*, 2020; Romano, Cesare P.R.; Boggio, Andrea, 2020.

tion must unfold to reach other fundamental goods like the biodiversity[102] and the environment and to handle global issues regarding green technologies, climate change, development, and sustainability. These issues show that any attempt to sketch the advancement of the right to science must transcend the national scenarios and reach joint international approaches.[103] The COVID-19 pandemic confirms this circumstance, it claims international collaboration. It is high time to walk these further research paths towards the advancement of the right to science.

At this point, it is essential to recognize a mutual influence in the field of rights between the national and the international level. Exploring the fundamental right to science in domestic contexts may deliver significant results to its progress as a human right beyond the states. At the same time, the domestic legal enforcement might suffer positive consequences by providing the human right to science with further clarification in the international scenario. This is also important because national states maintain the position of first duty-bearers regarding rights, their enforcement and effectiveness. Additionally, it is worth noticing that many domestic rights systems rely on regional or international systems as an extra guarantee; the interaction between various jurisdictions[104] plays an important role in rights protection.[105]

The track followed in this paper aimed to ground the right to science in a domestic legal setting and to identify its core normative elements. Due to the mutual influence referred above, it is reasonable to expect that the analysis exposed holds substantial significance beyond the Brazilian scenario. Moreover, this study, presently centred in this specific domestic order, ought to go further and encompass other jurisdictions with broader consequences for the advancement and effectiveness of the right to science.[106]

At the end, it is possible to conclude that the importance of an autonomous right to science is irrefutable. Simultaneously, this right is a decisive tool in the promotion of the other fundamental and human rights. On top of this, the right to science is key to addressing development in a sustainable way. Science and the right to science are not able to offer incontestable answers to complicated

102 Morgera, Elisa, 2015.

103 On how the right to science can contribute to a global ethical discourse, see Mann, Sebastian P. *et alii,* 2020.

104 For a critical approach on this interaction see Bjorge, Eirik, 2011.

105 On the use of international law on human rights in construing domestic constitutional guarantees, see Ramsden, Michael, 2018.

106 On the benefits of a comparative approach to the interpretation of «bills of rights», see Lee, Jack Tsen-Ta, 2007.

societal and environmental questions. Nonetheless, they are crucial to face these challenges and contribute to construing innovative paths within a rational, democratic, and rights-based framework.

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