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Patents on NGTs, between disputes and desire: the case of Crispr-Cas 9

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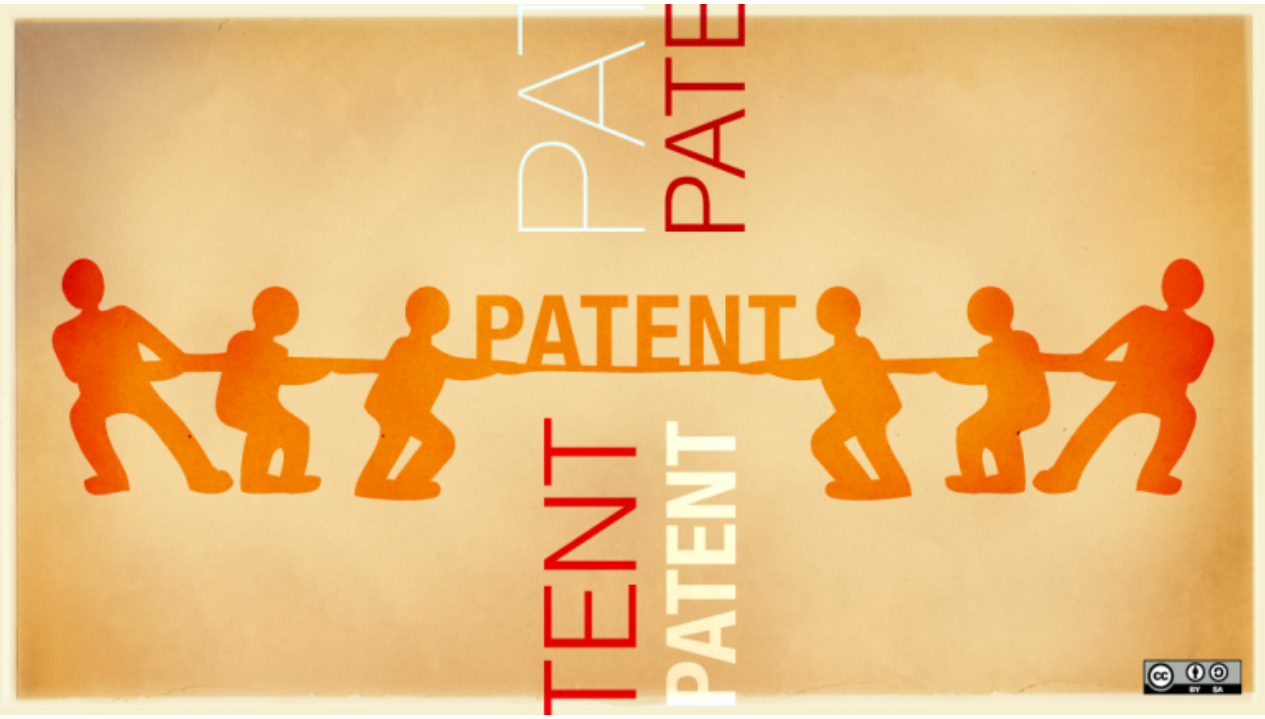
The patent rights applying to NGTs are vast and complex. They are also precious to a few multinational companies that want to control the economy of the sector. The illustration with Crispr-Cas.



Patents on "*new genomic technologies*" (NGTs*)* cover all areas of life, from fundamental research to its applications. The ownership of these patents is shared between the public and private sectors. For the industry, the profit potential of NGTs is considerable, and patents are the major guarantors of this. Crispr-Cas 9, the subject of the main NGT patent rights in the agricultural sector, is a clear illustration of this. This essential tool for this sector[i] is causing legal battles and leading to a concentration of the seed sector to the detriment of its "*small players*" and farmers.

Crispr-Cas 9, rights under pressure

Major patent rights on Crispr-Cas 9 are being claimed by the Universities of California and Vienna, on the one hand, and the Broad Institute (in partnership with MIT and Harvard) on the other. The former claim to have discovered Crispr-Cas 9 (Nobel 2020) in prokaryotes (bacteria), the latter its application in eukaryotic cells (animals, plants, fungi, etc.). These bodies are still involved in a dispute over some of these rights. Other parties are also involved in various proceedings concerning the Crispr-Cas system[ii] . Proceedings are under way in the United States to determine the first inventor (the old US system), and others at the European Patent Office.

The Max Planck Institute explains that the Crispr-Cas patent landscape will, as a result of these litigations, be characterised by multiple overlapping patents held by several parties[iii]. Several parties have filed patent applications in a very short space of time and, despite certain differences, they are largely identical for the application of Crispr-Cas 9 in the modification of eukaryotic cells.

The keenness of this legal battle illustrates the importance of the economic stakes associated with Crispr-Cas. Owned mainly by the academic sector, this tool is licensed to the private sector - notably agrochemical and pharmaceutical multinational companies - for commercial exploitation. The outcome of the litigations could affect the validity of the patents involved and therefore the licensing agreements.

... controlled by a few powerful players

Access to licence rights on Crispr-Cas 9 can be very expensive, *especially* if they are exclusive. That's why multinational companies such as Corteva, Bayer, BASF and Syngenta share the various licences available in the agricultural sector[iv] . This strategy also allows the licensors of the rights to be reassured that they will be used to the full. Another consequence of granting such rights to a small number of powerful players is that they favour the development of their own innovations and patents, thereby increasing the concentration of capital in an already highly concentrated sector. This is to the detriment of the diversity of the seed supply, which is reduced to the elite genetically modified varieties only of these few players.

This business model creates legal uncertainty for the other potential users of Crispr-Cas 9, and also affects the rights of farmers and small/medium-sized seed producers, who are competitors of these seed companies, as well as consumers. If the traceability of new GMOs, involving the publication of procedures for detecting and identifying them, were to be abolished, patents on Crispr-Cas 9 could in fact cover traits expressed by plant varieties resulting from conventional crossing/selection procedures, traits native to plant species, and so on. The appropriation of these characteristics *via* NGTs could therefore restrict the development of cultivated biodiversity, including that which produces food. This is one of the stumbling blocks in the discussions about the European Commission's proposal to deregulate NGTs (p.9-10).

[i]European Commission, DataM, "New genomic techniques", April 2024. Zheng *et al.*, " The Improvement of CRISPR-Cas9 System With Ubiquitin-Associated Domain Fusion for Efficient Plant Genome Editing", *Frontiers in Plant Science*, May 21, 2020.
[ii]GRUR, "New Genomic Techniques and Intellectual Property Law: Challenges and Solutions for the Plant Breeding Sector - Position Statement of the Max Planck Institute for Innovation and Competition", 8 January 2024.
[iii]*Ibid.*
[iv]Canadian Biotechnology Action Network, "Patenting genome editing in Canada", March 2022.

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