



# INNOVATION FROM BRAZIL'S BIOTECHNOLOGY SECTOR DRIVES ECONOMIC GROWTH

A CAS WHITEPAPER



As the seventh largest economy and the second largest middle-income economy in the world, Brazil leads Latin America with the most patent applications and trademark registrations. With the recent emphasis on strengthening international trade and foreign investment, the country's GDP has grown significantly over the past fifteen years, with substantial growth in the areas of non-durable consumer and intermediary goods. Patenting in the chemistry realm has been a major contributor to Brazilian patenting for over a decade, representing a steady 40% of the entire intellectual property (IP) portfolio over that period. Most notably, Brazil is in the top 30 countries worldwide for both R&D spending as a percentage of GDP as well as the number of domestically headquartered high technology companies.



One such high technology company is the nationally held FK Biotecnologia S.A. (FKB). The first recipient of international venture capital funding, FKB engages in strategic partnerships with both public and private institutions. The company participates in two primary arenas: shorter-term cancer immunodiagnostic assays and services with a longer-term focus on developing anti-cancer vaccines. Their 2004 patent (WO 01/77301) entitled “Tumor Cells Transformation Process” highlights their innovation in the latter in full-

text, as shown in PatentPak™, Figure 1). The invention covers the isolation, separation and subsequent culturing of a patient's tumor cells in the presence of interferon for a period of 72 hours. This enhances the MHC type I and II antigens on the cell surface of the tumor cells, thereby increasing their chances of being detected and targeted for elimination by the patient's immune system. The cells can then be reintroduced into the patient's blood stream, where they act as an “autologous vaccine” to treat the cancer.

**Figure 1:** The PatentPak screenshot of FKB's 2004 WIPO patent, which discusses a method to produce an anti-cancer vaccine.

The screenshot shows the PatentPak interface for patent WO 01/77301 A1. On the left, there are search filters for 'Key Substances in Patent' with CAS RN 50-99-7 and CAS RN 9004-10-0. The main content area displays the following information:

- (19) World Intellectual Property Organization International Bureau**
- (43) International Publication Date 18 October 2001 (18.10.2001)**
- (10) International Publication Number WO 01/77301 A1**
- (51) International Patent Classification:** C12N 5/08; 506, 1/16, 1/18, A61K 39/00, 41/00
- (52) International Application Number:** PCT/BR01/00045
- (22) International Filing Date:** 9 April 2001 (09.04.2001)
- (25) Filing Language:** English
- (26) Publication Language:** English
- (36) Priority Data:** BR0001625-4; 10 April 2000 (10.04.2000); BR
- (71) Applicant (for all designated States except US):** FK BIOTECNOLOGIA S/A (BR/BR); R. Washington Leta, 475, CEP-96010-400 Porto Alegre, RS (BR)
- (72) Inventor:** and
- (73) Inventor/Applicant (for US only):** KREUTZ, Fernando
- (54) Title:** TUMOR CELLS TRANSFORMATION PROCESS

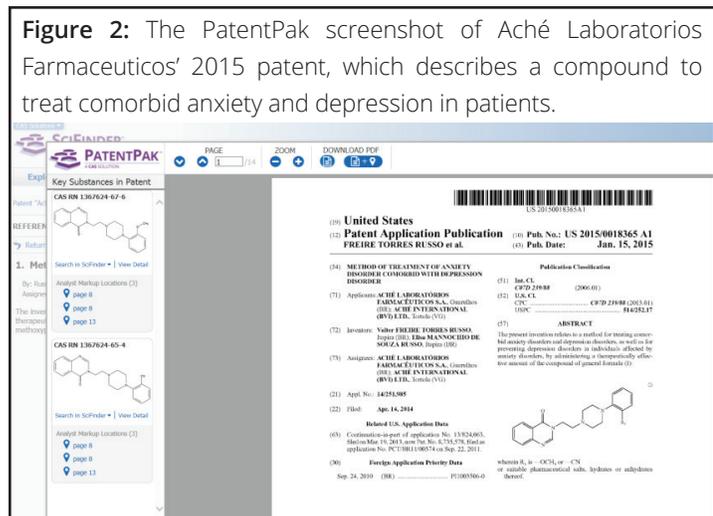
The text also includes a list of designated states and a note: "[Continued on next page]".

Another example of Brazilian innovation includes SciFinder® customer Aché Laboratorios Farmaceuticos S.A. A biopharmaceutical company with over 300 brands in their portfolio covering cosmetics, biologics and nutraceuticals, this company expects to realize R \$1 billion in revenue this year. Aché created an



Innovation Center involving five directors who have established key innovative initiatives to drive the business over the course of the next fifteen years. Their 2015 patent, entitled “Method of Treatment of Anxiety Disorder Comorbid with Depression Disorder” (BR 2010-3506 and US 2015/0018365; available in full-text, as shown

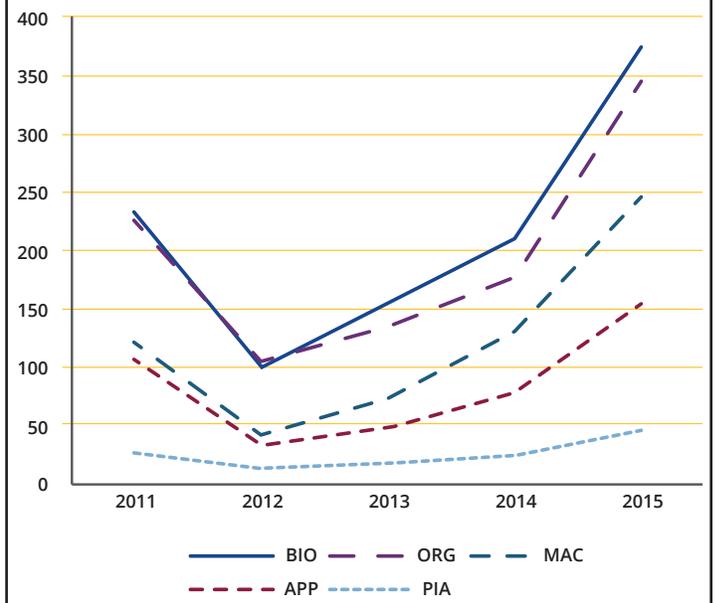
Worldwide intellectual property data confirm Brazil’s transformation as a country that fosters growth, innovation, and scientific development. Information taken from STN® reports that Brazil has experienced over 60% growth in chemistry-related patenting since 2011 (Figure 4).



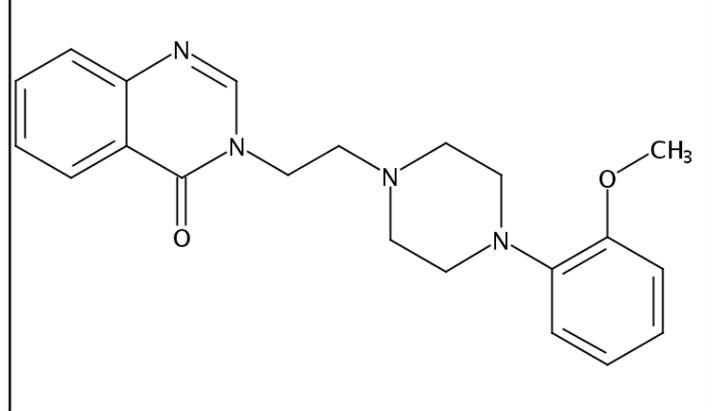
With chemistry as a solid component of the IP portfolio, enhanced government funding for infrastructure in place, and innovative companies participating in the biomedical space, Brazil is well positioned to capitalize on this economic momentum. Experts agree that Brazil

in PatentPak, Figure 2), involves the compound illustrated in Figure 3 (CAS Registry Number® 1367624-67-6), a substance shown to have anxiolytic effects without initiating withdrawal syndrome upon cessation of the drug. This patent claims the compound will be effective in those patients that have co-existing anxiety and depression disorders, as well as to prevent depression in those patients already suffering from anxiety disorders.

**Figure 4:** The sum of chemistry-related patents by CAS section code from 2011-2015 for Brazil. (BIO - Biochemistry; ORG – Organic; MAC – Macromolecular; APP – applied; PIA – Physical, inorganic, analytic) Source: STN



**Figure 3:** Compound described in US 2015/0018365, CAS Registry Number 1367624-67-6.



must move away from the agricultural sector and other traditional monopolies. A culture of small, inventive companies will help push the country towards an economy that emphasizes health, education, financial independence for all Brazilians.



## References Consulted

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4. Ferrer, M., et al. "The Scientific Muscle of Brazil's Health Biotechnology." *Nature Biotechnology*. 2004, 2222: DC8-DC12.
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