

# The Law and Economics of biotechnology and computer patents

## The European directive on biotechnological patent

- ☐ In 1998, and **after strong and lengthy political and technical debate**, the EU adopted the biotechnology patent directive
  
- ☐ The directive aims at setting a **common framework for the treatment of biotechnological inventions**, in view of the discrepancy between the positive attitude of EPO and some member States, and the hostility of others
  
- ☐ **Basic rules** of the directive
  - i. **Biotechnological inventions** are subject to the **same patentability requirements** as those for other areas of technology
  
  - ii. Patentable biotechnology inventions include **biological material** containing genetic information
  
  - iii. Patentable biotechnology inventions include **processes to act or result in biological material**

- iii. Patentable biotechnology inventions include **material occurring in nature, but isolated or produced by a technical mean**
  
- **Exclusions** from patentability
  - i. **Plant and animal** varieties
  
  - ii. **Essentially biological processes** (=breeding) for the **production of plants and animals**. Microbiological processes, including genetic engineering are not excluded
  
  - iii. The **human body** and its elements, including **genes**→ but **human biological material**, including gene sequences, when **isolated or technically produced**, are **not excluded**, even if genetically identical to natural ones
  
  - iv. Processes for **human cloning**
  
  - v. Processes for **modifying human genome**
  
  - vi. Uses of **human embryos** that are not reproductive or scientific
  
  - vii. **Cruel genetic alterations** of animals

■ **Scope** of protection

- i. Protection of a **biological material extends to that with the same characteristics created by propagation or multiplication** (except when it results from the intended marketing of the patented invention)
- ii. Protection of a **process** to produce a biological material with some characteristics, **extends to material with the same characteristics created by propagation or multiplication** (except when it results from the intended marketing of the patented invention)
- iii. Protection of a product patent **containing genetic information extends to all material in which the product is incorporated**, and containing the genetic information
- iv. **Farmers' exception**: use for propagation or multiplication in the farm
- v. **Compulsory licensing** between patent holders and plant variety right holders when they are mutually **blocking**

## The European directive on computer-implemented inventions

- ☐ In **2002** the European Commission has launched a **proposal for a directive on patents for computer-implemented inventions** which has been **adopted** in **2004**
  
- ☐ The directive presumably tries to give **EU-wide force to the recent precedents of the EPO**, given the uncertainty present or anticipated on national PO and Courts. Its declared purpose is not to go beyond current EPO precedents
  
- ☐ The directive **tries to combine**:
  - i. **Preserving the exclusion of computer programs as such** from patent protection
  - ii. **Existing level of copyright protection** to software expression showing creativity
  - iii. **Patent protection for inventions** (so covering all types of computer code or language) **implemented through a computer program**, in which a **technical contribution** (be it in the field of computer science or other technical field) is involved

■ **Basic rules** of the directive

- i. Computer implemented inventions are those **involving the use of a computer, the novel features of which obey partially or totally to a computer program**
- ii. Computer-implemented inventions belong to a **field of technology**
- iii. Computer implemented inventions should be **patentable if satisfy the general requirements for patent protection**
- iv. **Inventive step** for a computer implemented invention requires a **technical contribution** → a non-obvious contribution to the state of the art in a technical field. If the only non-obvious contributions are non-technical (**purely mental, or related to business or marketing**) → the test is not met and there should be **no patent**
- v. **Technical contribution** test should be carried out **jointly considering technical and non-technical elements** of the patent application claims (dubious coherence with previous principle)
- vi. Computer implemented inventions could be **claimed as product** (the programmed

computer or network) or as **process** (software run process) patents

- vii. **Copyright protection** of software expression remains **unaffected**, and specifically, **permitted acts of reverse engineering** under the computer programs copyright Directive **cannot be prevented** through the exercise of **patent rights**

## Analyzing the effects of the directives

- The directives address some economic problems:
  - i. **Clarifies legal uncertainty on** patentability, and thus the **outcome of R&D investments** in those fields become **more predictable**
  - ii. **High R&D costs** in the fields: **True for biotechnology, much less so for software** patents
  - iii. These inventions would not receive legal protection (weakening investment incentives) in the absence of patent protection. True for biotechnology. False for software:
    - 1. Existing copyright protection has not been proven insufficient
    - 2. Alternative means to raise revenue to cover fixed costs of developing software programs:
      - a. Lead-time for short-lived products
      - b. Tying with private good (update, service)
      - c. Becoming the standard

- In dynamic and fast-growing fields of technology, the risk of potentially **slowing the pace of further innovation** that builds upon existing knowledge is high:
  - i. The existing **stock of knowledge** in the public domain is still very **limited**
  - ii. The likelihood of **blocking patents**, due to relative inexperience of patent offices, is high
  - iii. **Evaluating profitability** of inventions to calculate compulsory licenses is still relatively uncertain
  - iv. Fragmented character of the industries
  
- Many **software patents actually refer to or comprise business or marketing elements**, which would give rise to a very prejudicial form of exclusive right distorting competition in already competitive industries
  - i. Amazon one-click-sale patent
  - ii. Encyclopaedia Britannica patent on a multimedia CD-ROM that searches for multimedia
  - iii. A data processing system for managing mutual funds by which the mutual funds pool assets in an investment portfolio in the form of a partnership

- iv. An algorithm to calculate airline ticket prices based on data of past demand in same periods
- v. Storing music on a server with back up servers, allowing users to listen to music by clicking on a list of songs