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Blood: An Undreamt-Of Market

Blood plasma. The lure of therapeutic proteins has caused the price of this blood derivative to climb.

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Joseph Galli, of Haemacure: “With human plasma, we eliminate certain problems that bovine products present. It’s purer and safer.”

In the future, the lives of millions of people all over the world will be saved thanks to protein-based medicines. These molecules, which directly target the cause of disease in the organism, open the door to a revolutionary approach in medicine, comparable to the one Pasteur introduced with his rabies vaccine. Yet numerous challenges confront this promising industry: research funding, the availability of the blood plasma from which the raw material is drawn, and the high price of treatments which are slowing expected progress.

Human plasma contains a number of proteins that are used to manufacture roughly 20 therapeutic products.

According to a 2005 study conducted for Héma-Québec, plants fractionating plasma proteins treat over 25 million litres of plasma every year worldwide. Sales in the plasma-derived protein market were nearly \$5 billion in 2005.

Fractionation plants

Among the most valuable proteins extracted from plasma are albumin, which represents 28% of this market, and gamma globulins, which represent two thirds of plasma product sales.

Haemacure of Montreal extracts fibrinogen and thrombin from human plasma, the two proteins used in manufacturing its fibrin glue, which prevents post-operative adhesion. Fibrin glue and thrombin are its two flagship products.

“With human plasma, we eliminate certain problems that bovine products present. It’s purer and safer,” said Joseph Galli, Haemacure’s Chief Executive Officer.

Like many others, the company looks to the United States for its supplies. There are approximately 70 fractionating plants in the world. The U.S. has the largest number, with an average processing capacity of 1.1 million litres per plant, according to the Marketing Research Bureau. Europe comes second, and Asia rounds out the leading three. Approximately 60 grams of protein can be extracted from a litre of plasma.

The growth in demand for biopharmaceutical proteins is putting pressure on plasma of human origin, whose availability is limited because of increasingly stringent selection criteria for donors, and tightened requirements on collection and screening methods.

“Over the past few years, the price of a litre of plasma went from \$125 to \$200. The market should stabilize over the next two years, because there has been consolidation in the industry. In 2010, available volume should rise,” predicted Galli.

High costs

It takes approximately 18 months for a blood sampling site to be certified by the Food and Drug Administration, and another 18 months for it to accumulate operating reserves.

The budget dedicated to plasma-derived products in Canada is approximately \$274 million per year and growing. Though the country is self-sufficient in terms of plasma for transfusion purposes, it collects only a third of the plasma it needs for fractionation.

At Héma-Québec, surplus plasma not used for medical purposes is sent to an American fractionator, which returns the isolated proteins. The organization thus covers 20 percent of its total needs in immunoglobulins and 75 percent of its needs in albumin, proteins that are particularly used in research.

There is only one fractionating plant in Canada, in Winnipeg. This hyperspecialized company is dedicated to a single molecule, anti-D immunoglobulin, used to avoid certain types of miscarriages.

“Building a fractionating plant is very expensive, from one to two billion,” said Jean Lapierre, Director, Stable Products, at Héma-Québec. “But we’re seeing a consolidation of the sector. A smaller number of players are producing ever-increasing volumes. This is going to be reflected in prices.”

Blood plasma

A component of blood, plasma serves to transport blood cells and hormones throughout the body. It is 90 percent water. It contains mineral salts and organic compounds (nutrients, urea, etc.) and proteins, such as fibrinogen (a coagulation protein), globulins and albumin.