

# Scientists study one of the lesser-known *Facts of life*

The process of life — from womb to tomb — has always held a fascination for man, who has succeeded in solving some of its many mysteries. However, others continue to elude him.

Have you ever wondered, for instance, what it is that directs a cell to form part of an eye or an ear, instead of an arm or a leg? Instinct? Secret agents? As yet, no one really knows. But scientists at the Université de Montréal have embarked on a long-term study to try to find out more about this lesser-known fact of life.

Aided by a \$300,000, three-year Negotiated Development Grant from the National Research Council of Canada, a team of experts at the University's new Laboratory of Molecular Biology has begun to study a process known as differentiation.

Negotiated Development Grants were initiated by NRC in 1967 to assist universities to develop new or interdisciplinary research centres, particularly in fields relevant to the scientific, economic and resource development of Canada.

Differentiation is the process by which multi-cellular plants and animals develop different tissues, structures, and organs from one fertilized egg cell. In man, it is simply the development of cells producing a body which is correctly formed.

The word cell — after the Latin "cella", meaning a small room — was first used by the English physicist Robert Hooke, as early as 1665, to describe the small holes he found in cork. Nearly two centuries later, in 1839, Theodor Schwann, a German physiologist and Matthias Schleiden, a botanist, established what is called the cell theory — that all plants and animals are made up of cells and their products; the cell is the unit of life, and reproduction and growth are due to cell division.

Almost another century-and-a-half has passed. Scientists now believe differentiation is tied to the almost simultaneous division of the egg cell which occurs when it is fertilized. But they are still trying to uncover what it is that motivates the fertilized cell to form part of a specific body structure. The Montreal group hopes to find out, or at least, narrow the gap between this miracle of nature and man's present knowledge.

"The NRC grant," says Dr. Gilles H. Cousineau, assistant professor and team member, "will enable us to get the proper equipment and our instruments will be placed at the disposal of the whole university."

NRC's financial assistance also is enabling the team to expand, but Dr. Cousineau says, "we want to keep its family-like atmosphere, and don't want more than 25 people, including a permanent nucleus of about ten."

In the early stages of the long-term project, many of the group spent much of the summer at the marine laboratory at Woods Hole, Massachusetts.

There, a small spiny creature called the sea urchin, is in plentiful supply. This sea creature has been one of the team's chief sources of information into cell differentiation, because it can be electrically stimulated to yield millions of sperms or eggs.

"We can get billions of eggs fertilized simultaneously. We know they are doing exactly the same thing at the same time and our findings can be accurate," Dr. Cousineau says.

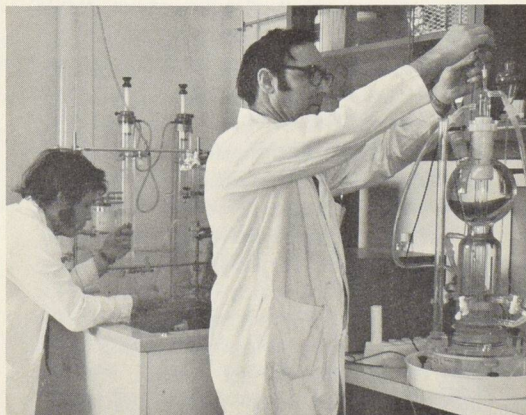
The Montreal laboratory itself is beginning to breed sea urchins for purposes of the study and eventually it hopes to apply the results of the research to the basic facts of life in the cell and to "reprogram" cells in a test tube.

"The techniques we devise along the way will be valuable and some of the findings may have medical applications," says Dr. Cousineau.

The group has already established contact with molecular biology laboratories in Massachusetts, California and Naples, Italy.

"We want to initiate and develop in Montreal," says Dr. Cousineau, "one of the greatest world centres of molecular biology . . . and I am certain that someday, something important is going to happen." ■

Team members Guy Bellemare and Rosaire Dubois with equipment used for isolation and purification of sea urchin ribonucleic acids.



Guy Bellemare et Rosaire Dubois isolent et purifient les acides ribonucléiques tirés d'oursins.