



# Artur Bartkowiak

## Director for the Centre

Centre for Bioimmobilisation and Innovative Packaging Materials, West Pomeranian University of Technology Szczecin

<http://cbimo.zut.edu.pl/en>



## Bilateral Meetings

- Thursday (1:30pm - 6:00pm)
- Friday (9:00am - 12:00pm)

## Description

Centre for Bioimmobilisation and Innovative Packaging Materials (CBIMO) is an interdisciplinary group working within Faculty of Food Sciences and Fisheries. Our research activities are mainly focused on following topics:

- bioimmobilization and microencapsulation of living cells, bioactive substances and food-additives (encapsulation from macro- down to nano- scale),
- biodegradable food-packaging materials (mainly cellulose, starch and PLA based materials),
- characterization and various methods of food packaging,
- isolation, chemical modification and purification of biopolymers (specifically polysaccharides and their hydrophobic derivatives),
- physico-chemical characterization of biopolymers,
- medical materials and devices, in cooperation with Pomeranian Medical University in Szczecin.

Especially CBIMO has some expertise in:

- microencapsulation based on natural and modified polymers (polysaccharides and proteins), - immobilization of living cells (mammalian and bacterial),
- food-bioactive substances (nutraceuticals) and taste and smell masking,
- formation and characterization of microcapsules (mechanical and permeability),
- formation, modification and characterization of packaging materials including mainly paper, paperboard and polymer films,
- food and packaging interaction "active packaging".

More information available here: <https://goo.gl/hiUPzi>

Organization Type

University

Organization Size

26-50

Founding Year

2002

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Country

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Offer

## **Bioactive material for immobilisation and micro encapsulation - partner requested**

We have developed an innovative method of immobilisation and encapsulation of bioactive materials. The offered technology is ideal for food and medical or cosmetics industry as a natural, pro-environmental way of preservation. It is 100% checked, tested, confirmed and fully functioning.

We are looking for companies involved in food, medical or cosmetics sector interested in buying a license and R&D institutions for establishing technical cooperation.

Our group of scientists has developed new method of bioactive materials' immobilization and encapsulation. Micro encapsulation is an ecological method of food preservation in a food industry. This process occurs naturally in the environment and binds microorganisms with a carrier so as to restrict their free movement, while providing access to nutrients and, at the same time, outflow of waste products. Micro encapsulation is a method of closing cells in materials, i.e. inside capsule which imitates natural biological membrane. As all components have no chemical additives, capsules are eatable. The offered method is environmental friendly and safe for people. Moreover it is based on typical industrial methods, which makes it economically beneficial and 100% operative.

We are looking for companies that would like to buy a license. The partner will be responsible for implementing technology in its production processes with support of the researchers. For further technology development technical cooperation is offered to R&D institutions.

Advantages and innovation:

- the offered technology has been tested and is 100% operative,
- it is bio-based, safe and natural preservative method,
- the technology allows the possibility of environmentally friendly external control of membrane microcapsules such as mechanical strength and porosity,
- material can be manufactured both by one- and two-step process, depending the required properties,
- pH from 3,0 to 8,0 is possible,
- moreover, we have experience in the implementation of numerous similar projects and cooperates with industry for

over 10 years

- Type of partner sought: R&D sector and industry.

- Specific area of activity of the partner: food sector, medical sector, cosmetics sector, preservation, preservatives

- Task to be performed by the partner sought: the company should be able to implement the technology and R&D institutions should be able to cooperate in range of its further development.

More information available here: <https://goo.gl/hiUPzi>

Keywords: immobilisation bioimmobilisation micro encapsulation

Cooperation Offered

1. Technical co-operation
2. License agreement
3. Sales / Distribution

Offer

### **An innovative kit for cord blood collection is offered under license agreement.**

Our research team, together with scientists from Pomeranian Medical University of Szczecin, has developed a kit for cord blood collection based on the gravitational force coupled with a suction system. This combination allows for the collection of an increased volume of blood in such way that the number of collected stem cells is sufficient in accordance to standards required for therapeutic purposes.

We are looking for business partners from medical industry who want to introduce the kit on the market under license agreement.

Our new method of cord blood collection allows for its better effectiveness. One of our research team members has a years-long experience in cord blood collection process. He has identified a problem with loss of 40-60% of blood collected with use of available methods, so the team has started work on a kit that improves the collecting process - a simple system that make it possible to increase volume of blood collected from a cord and placenta in this way that the number of collected stem cells is sufficient for therapeutic purposes. The whole process is also safe for mother directly after childbirth guaranteeing natural placental expulsion without the risk to patient's health.

Potential usage of cells isolated from cord blood and placenta for standard therapeutic purposes may be effective when provided blood allows for the isolation of at least  $1,5 \times 10^7$  mononuclear cells for 1 kg of patient's body mass in order to safely conduct successful transplantation. However, currently known cord blood collection techniques allow for collection of not more than a half of cord blood left after the childbirth in the umbilical cord and the placenta. Available technics allows for transplantation only for patient with body mass lower than 40 kg. For an adult patient one unit of

cord blood is not enough. At the same time providing more units of antigenically compatible cord blood makes the whole procedure more complicated and significantly more expensive.

The kit for cord blood collection is equipped with the needle, tube, syringe and reservoir. At least one of reservoirs is connected with at least one blood collection needle by a means of collection tube and it has two syringes connected with the reservoir by branched tube or separate tubes. In the first syringe there is a liquid anticoagulant. The second syringe is in a form of sucking system, which supports collection of blood in gravitational manner. Syringes used in the kit may be operated manually or with the use of syringe pump. In the simplest version, the reservoir has a form of a bag. The size of reservoir is adjusted to expected amount of blood to be collected. The collection tube and the tube are equipped with closing elements that allow for sealing of collected blood in a container and subsequent disconnection of syringes without reservoir unsealing.

The kit is available as a working prototype. The scientist are looking for business partners from medical industry who are interested in launching it on the market under license agreement.

The offered kit improves the whole collection process and allows to maximize blood yield in comparison to the already-known methods where the loss of collected cord blood is about 40-60%. Instead of pump the kit is based on use of two syringes. It allows to control and dose the amount of anticoagulant into the blood reservoir as required and in case of collection of more blood than it was planned anticoagulant can be injected again. This feature prevents excessive amount of anticoagulant in the reservoir relative to collected blood, which was not possible in solutions known from the prior art. Moreover the kit is safe and minimize risk of blood contamination. The invention allows to use a smaller sized reservoir adapted to premature neonates what simplifies its storage by the use smaller frosting cassette. At the same time it possible to place higher number of bags in the same tank in comparison to standard larger bags.

WIPO Patent Application applied.

Keywords: blood collection kit stem cells

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