# ROUND ROBIN EXPERIMENT "BEAD PRODUCTION TECHNOLOGIES" COST 840 – Working Group 3

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## Introduction and purpose

The encapsulation of various materials inside beads for various purposes in the pharmaceutical, chemical or food industry as well as in agriculture or biotechnology is of great importance. Thus, a large number of papers deal with this topic. Despite the broad application of bead–encapsulated material the knowledge about the different technologies for bead production and their advantages and disadvantages is limited. From literature it is not easy to extract which might be the best technology available for the special encapsulation purpose as the different technologies have so far not been compared to each other with the same material.

In order to give a potential user comparable data about the different common bead production technologies, several members of the Working Group 3 within the COST 840 action started the round robin experiment "Bead production technologies" in which beads of a definite diameter will be produced by the most common technologies using the same polymer solutions as starting material.

## Participants

The participants of the round robin experiment and the technologies which they are using for the production of the beads are indicated in Table 1.

*Table 1. Participants of the round robin experiment and their bead production technologies*

| Participant | Institute | Technology |
|---|---|---|
| Benjamin Massart | Institute Meurice, Brussels | Vibration, JetCutter |
| Claudio Nastruzzi | University of Perugia, Perugia | Electrostatic dropping, Vibration |
| Denis Poncelet | ENITIIA, Nantes | Vibration |
| Peter Gemeiner | Slovak Academy of Science, Bratislava | Air–flow enhanced dropping |
| Ulf Pruesse | FAL, Braunschweig | JetCutter |
| Stefan Rosinski | Polish Academy of Science, Warsaw | Electrostatic dropping |
| Victor Nedović | University of Belgrade, Belgrade | Electrostatic dropping |

## Implementation

Each participant received sodium alginate powder (Protanal LF 20/40 supplied by FMC Biopolymer) which has been taken from the same batch together with detailed instructions how to prepare solutions with an alginate content of 0.5%, 1%, 2%, 3%, and 4%. The solutions should directly after preparation be characterised with regard to their viscosity and used for the production of the beads.

Beads with a resulting diameter of 800±100 μm shall be produced with the different technologies. The production rate for each experiment will also be recorded and shall serve as criteria for the throughput of this technology. Afterwards the size distribution shall be characterised by taking photographs of the beads under a microscope.

At the moment the round robin experiments are still running and not every result is available, yet. The experiments will probably be terminated in June 2004.

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