BIOMEDICAL APPLICATIONS OF NANODIAMONDS:

New Biodegradable Nanostructured Materials Enhancing Osteogenesis

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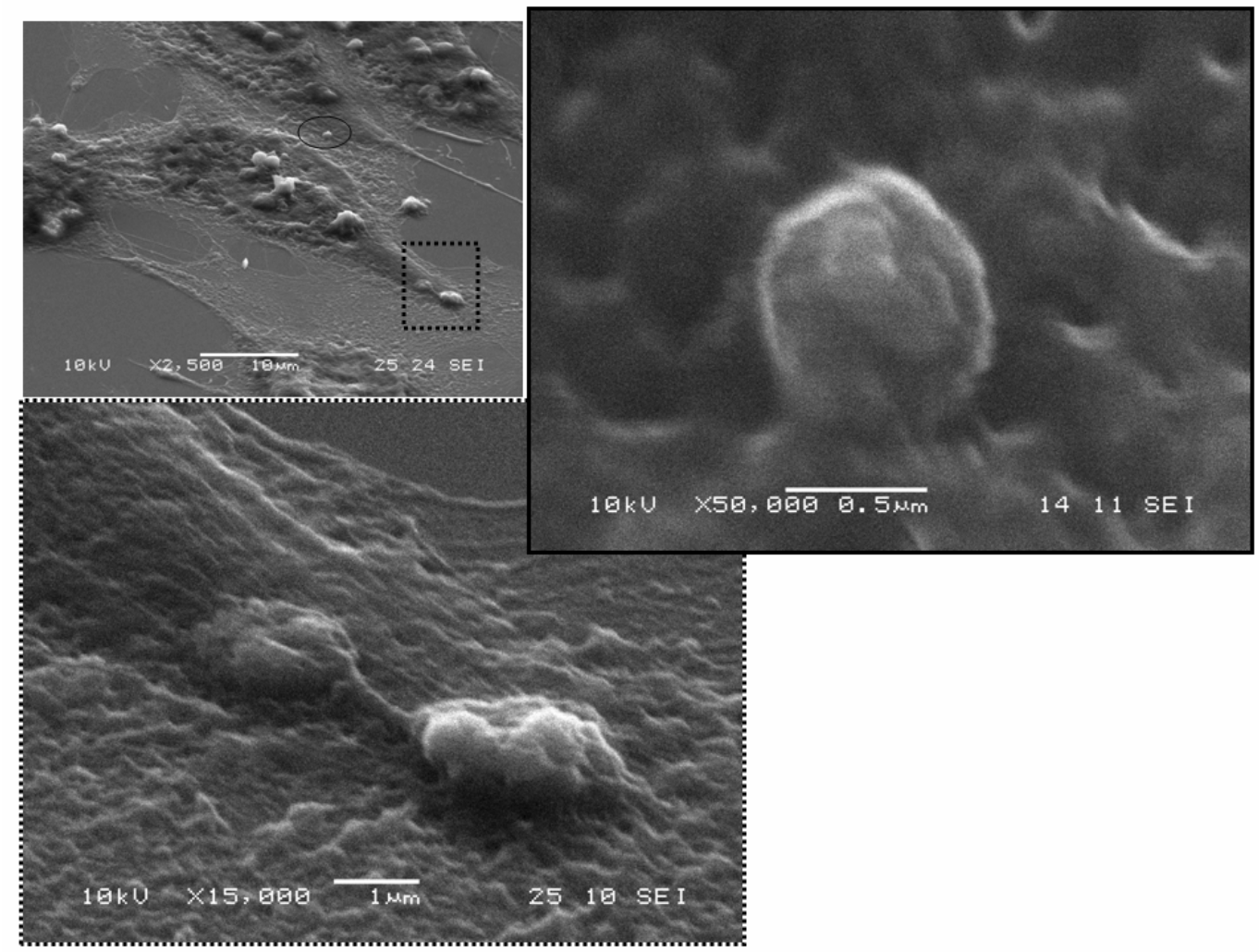
New 3D biodegradable nanostructured materials were developed, charged with progenitor cells, with the aim to help the regeneration of bone tissue.

These materials are based on a **gel composite combining:**

Smart polymers – their water solutions display an exotic phase behaviour, which makes them suitable for biomedical applications

Nanodiamonds – they serve as crystallyzation centers for calcium phosphates crystals growth



SEM microphotograph of the interaction of endothelial cells with nanodiamond particles

Experiments on female rats with a model of osteoporosis show that **smart polymer / nanodiamond composites, when injected into injured bone, serve as a basis for the growth of a healthy bone tissue**.

It seams, nanodiamonds play a crucial role as centers where the growth of new bone tissue begins.

When nanodiamond concentration was too high, an excessive growth of bone tissue was observed!

Results: The so proposed smart polymer – nanodiamond composite gels can be further developed as a promising new therapy for osteoporosis.