Tissue Engineered Bone

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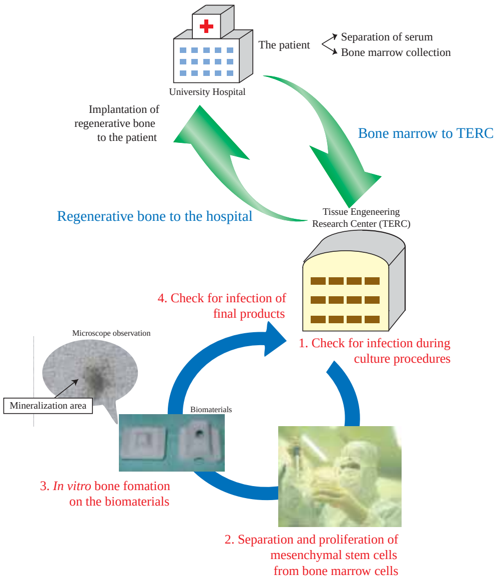
We have succeeded in fabricating "bones" by cultivating bone marrow collected from patients and transplanting the "bone" back to the patients as artificial joints. This is the first such feat in the world. When joints are badly damaged, one of the treatments would be total joint replacement. However, there have been reports of cases in which artificial joints became loose around implanted bone tissues, and had to be removed. In order to solve such problems, we have come up with an original idea of coating joint prostheses with osteogenic cells or their precursors from the patient. Bone marrow was collected from patients at Nara Medical University and Tissue Engineering Research Center (TERC; Ikeda City) isolated the mesenchymal stem cells (MSCs) and increased their number in culture. After the culture expansion, the cultured stem cells have differentiated into osteoblasts together with bone matrix formation on the surface of the prostheses under osteogenic culture conditions. Then, the cultured bone was transplanted back to the patients. The development could lead to possible applications in treating various bone and joint diseases, including rheumatoid arthritis and bone tumors, as well as for tissue regeneration medicine to treat various diseases of organs. Hopes are pinned on the new technology to develop into new treatments that will not require organ transplants.



Regenerative cultured bone on prosthesis

GUPPY: A Sequence Information Viewer Program

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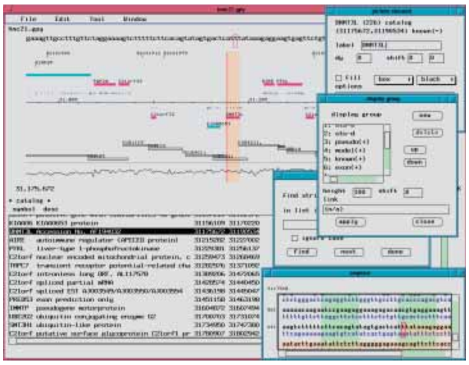
GUPPY (Genetic Understanding Perspective Preview System) is a viewer program for genetic sequence annotations with graphical layout. It is a highly interactive program which allows smooth zooming of focused sequence regions from a whole genomic view. The program also equips scripting facilities to maximize flexible adaptation to various kind of databases and analysys programs in molecular biology. The program is available for academic use from our homepage (http://staff.aist.go.jp/yutaka.ueno/guppy/).



A screen shot of GUPPY program with the sequence map of human chromosome 21. The annotation data were obtained from DDBJ/CIB Human Genomics Studio (http://studio.nig.ac.jp/)