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Superconducting Ceramics

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With freeze fracturing, most sperm cells appear to be fractured through the plasma membranes. Only few fracture planes through the cytoplasm are found. Both the PF as well as the EF side of the sperm cell plasma membranes contain irregularly distributed membrane particles. The EF side of the plasma membrane contains approximately three times as many particles per μm^2 as the PF side.

IN HUMAN MACROPHAGES THE DEVELOPMENT OF THE ENDOGENOUS PEROXIDATIC ACTIVITY PATTERN COINCIDES WITH THE EXPRESSION OF THE DIFFERENTIATION ANTIGEN RFD7: AN ULTRASTRUCTURAL IMMUNOCYTOCHEMICAL STUDY

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On the ultrastructural level we studied the development of the peroxidatic activity (PA) pattern of human macrophages in bone marrow, blood and peritoneal cell cultures in combination with immunochemistry using the MoAb RFD7. Blood monocytes were negative; however, 5% of the inflammatory macrophages of CAPD patients and 40% of laparoscopy macrophages were positive for RFD7. After culture monocyte-derived macrophages expressed RFD7, while the PA pattern changed from the exudate type to the more mature stage of resident macrophages. In bone marrow cultures monoblasts and promonocytes were negative; developing monocyte-like macrophages expressed a low % and a high % of more mature macrophages (based on the PA pattern) expressed RFD7. In conclusion, the expression of RFD7 in vivo and in vitro coincides with the development of the PA pattern of more mature mononuclear phagocytes and so RFD7 recognizes only well differentiated macrophages.

SUPERCONDUCTING CERAMICS

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TEM observations are reported on both YBaCuO and the Pb-doped BiSrCaCuO. Especially it is shown that due to the high value of the lattice parameter along the x axis, so-called high resolution lattice imaging micrographs can be easily made and applied in order to observe lattice defects like stacking faults, tilt and twist boundaries. We also have been successful in simultaneously imaging a twin boundary both in the transmission electron microscope and in our field ion microscope. The ultrasonic pulse echo technique has been applied to compare the density of the sintered HIP'ed and explosion-densified samples. The drop in density while forming the 110K from the 80K BiSrCaCuO turns out to be dramatic. An empirical relation between the porosity and Young's modulus enables us to predict the zero porosity value. As a more practical result we show scanning electron micrographs of a composite consisting of YBaCuO with 10 w/o Ag which is superconductive, dense and ductile.

ELECTRON MICROSCOPY OF NEMATODE-FUNGAL INTERACTIONS

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Nematode-trapping fungi comprise a group of fungi which attack living nematodes with the aid of adhesive or mechanical trapping devices. These specialized mycelial structures are remarkable since they not only firmly hold on to the nematodes but also bring about penetration of the nematode cuticle and digestion of the nematodes by trophic hyphae. In this contribution a method is presented that enables studies to be made of single nematode-fungal interactions under conditions where fungal growth at the expense of external nutrients is prevented, using the trap-forming fungus *Arthrobotrys oligospora* as a model organism. The method is based on removal of the traps from the vegetative mycelium, immediately after a nematode was captured and transfer of the trap with the captured nematode into a droplet of sterile distilled water placed in a moisture chamber. In the absence of external nutrients, such isolated traps