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A Receptor-Like Glycoprotein from *Dictyostelium discoideum*: Functions in Phagocytosis and Cell Adhesion?

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A Receptor-Like Glycoprotein from *Dictyostelium discoideum*: Functions in Phagocytosis and Cell Adhesion?

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The molecular mechanisms for the initial recognition and subsequent internalization of food and unicellular pathogens by phagocytes are incompletely understood. We have hypothesized that a surface-exposed, glycosylated 130 kDa protein, gp130, that is concentrated on the plasma membrane and found in phagosomes, has a role in phagocytosis by *D. discoideum* amoebae. Gp130 appears to have a cytoskeletal association and has extracellular domains susceptible to proteolytic digestion. It is tightly bound to the plasma membrane probably via a carboxyterminal hydrophobic anchor predicted from the cDNA. Gp130 may be the same as a similarly sized protein, gp126, that was implicated as a phagocytosis receptor and a cell adhesion protein during starvation-induced development (Chadwick *et al.*, 1984, Nature, 307, 646). Primers for DNA polymerase chain reaction (PCR) were designed from internal amino acid sequences of proteolyzed gp130 and its gene sequence was determined by PCR and cycle sequencing. The cDNA of gp130 has about 30 percent amino acid sequence similarities to the glycosylated 138 kDa proteins (gp138A, B, C) associated with mating type recognition in *D. discoideum* and weaker but significant similarity to putative receptors associated with disease resistance in plants. A polyclonal antiserum raised against bacterially-expressed gp130 strongly stains the plasma membrane of *D. discoideum* amoebae and is specifically reactive with denatured protein on blots. During vegetative growth of bacterially- and axenically-grown cells, steady state mRNA and protein levels of gp130 are relatively high. Upon transition to starvation-induced development, these levels decline, suggesting a function for gp130 in actively growing cells rather than in development. The role of gp130 in the recognition and binding of food particles during phagocytosis and in cell-cell adhesion will be tested with antibody inhibition studies and by constructing knock-out strains lacking gp130.