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Adhesins and Ligands Involved in the Interaction of *Candida* spp. with Epithelial and Endothelial Surfaces

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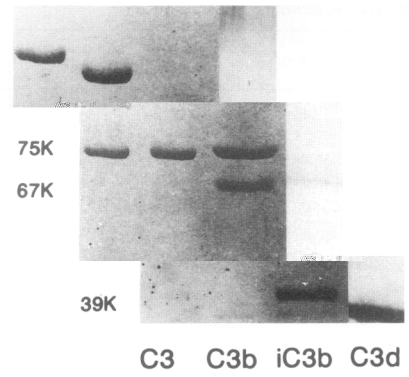
appear to vary among different types of epithelial cells and

TABLE 1. Epithelial and endothelial adhesins

Adhesin	M_r (10^3)	Epithelial ligand	Inhibitor(s)	Gene	Reference(s)
Epithelial					
Protein-protein					
Integrin analog (iC3b receptor)	130–165	iC3b	MAb, iC3b, RGD peptides	No	5, 27, 29, 37, 39, 45, 49, 82
Fibronectin	60–68	Fibronectin	Fibronectin, proteases	No	100
Lectin-like					
Fucose-binding protein	ND[a]	Fucose	ND	No	22, 23, 25, 70, 72, 105



COMPLEMENT RECEPTORS

...ian Cells	...Receptor	...C3 Ligand	Mamma...
...N's, macropnages, ...nocytes, lymphocytes, ...C's, renal podocytes	CR1	C3b	PMN's, mo... RB...
...mphocytes	CR2	C3d	B ly...
...N's, macrophages, ...nocytes, NK cells	CR3	iC3b	PM... mo...
...N's, macrophages, ...nocytes, NK cells	CR4	iC3b	PM... mo...

β_2 INTEGRINS

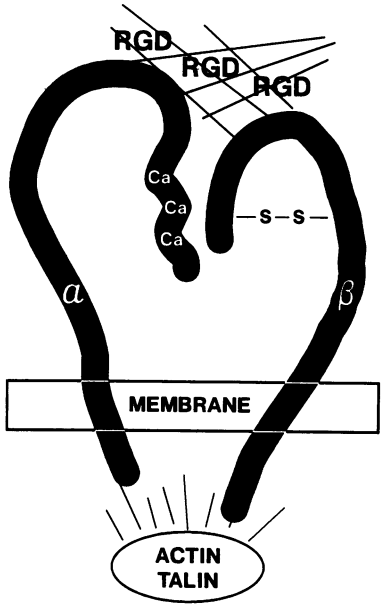


FIG. 3. Diagrammatic representation of α- and β-chains of the mammalian integrins. The amino termini are extracellular, the transmembrane domains are represented by the shaded areas, and the cytosolic tails are located at the carboxy termini, where they

TABLE 2. Binding of MAbs to *C. albicans*[a]

Specificity	MAb	Isotype	with *C. albicans*	recognized (kDa)	EA rosette	Adhesion
α_M	OKM1	IgG2a	++++	42, 130, 165	Yes	No
	Anti-Mo1	IgM	++++	165	No	No
	MAb 17	IgM	+++	ND	ND	Yes
	MAb 44	IgG2a	+++	ND	ND	Yes
	Mn41	IgG1	+++	ND	ND	ND
	OKM10	IgG2a	++	ND	ND	ND
	M1/70	IgG2a	++	ND	ND	ND
	Mac-1	IgG2b	ND	ND	Yes	ND
α_X	BU-15	IgG1	++++	165 ± 15	ND	ND
β2	TS1/18	IgG	0	ND	ND	ND
	MHM23		0	ND	ND	ND
CR2	HB5	IgG2a	0	ND	Yes	ND
	Anti-gp140	Polyclonal	0	ND	Yes	ND
	Anti-B2	IgM	0	ND	No	ND

cific binding of MAbs were not included. In ligand binding OKM1. As can be seen from Fig. 4, there is ob

assays, the 42-kDa protein bound $C3(H_2O)$, C3b, and iC3b. immunofluorescence on yeast cells, germ tubes, and pseudo-

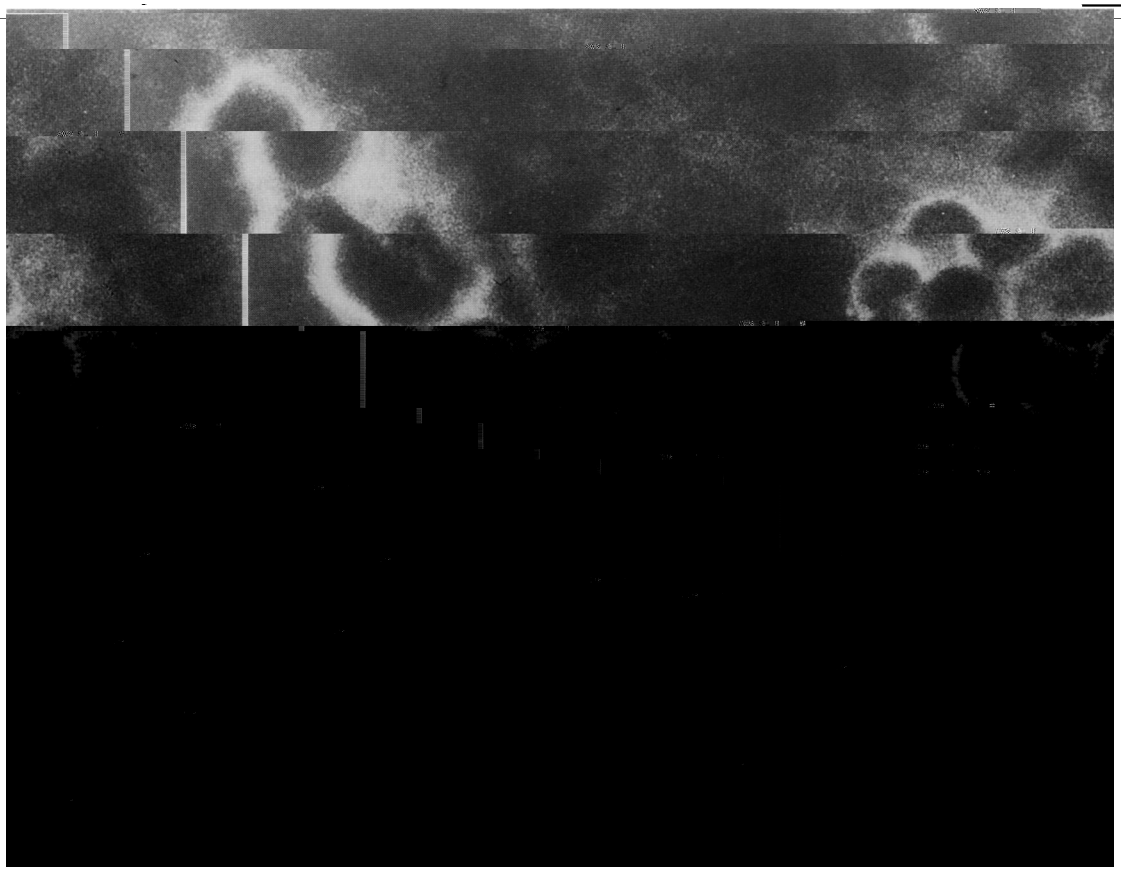


FIG. 4. Photomicrograph of *C. albicans* removed from the peritoneum of fungemic mice and incubated with MAb OKM1. There is visible immunofluorescence surrounding both blastospores and germ tubes (52).

O express the H antigen, a glycoside containing D-galactose, *N*-acetyl-D-glucosamine, *N*-acetyl-D-galactosamine, and an

proteinase activity and from the employment of assays that distinguish adhesion from invasion.

Parameter	Epithelial adhesion	Endothelial adhesion

of the extracellular matrix, including type I and IV collagen, fibronectin, and laminin. Interestingly, although fibronectin easily inhibited candidal binding to all four substrates, RGD peptides did not reproducibly inhibit binding to collagen or teins (62) but had no effect on hepatic uptake (96) emphasizes again the tissue specificity of adhesion and the possibility that sequences surrounding the RGD site could regulate binding specificity.

antiserum against this protein has been used to stain kidneys, cutis, or urethral epithelium and demonstrates the presence of the protein in both blastospores and pseudohyphal forms in vivo. However, the antibody did not signifi-

genesis, has just begun. Diligent investigation will provide new insights into these mechanisms and ultimately improve treatment of candidal infections.

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albicans adherence to human vaginal epithelial cells in vitro. ties analogous to bovine conglutinin and functions as a recep-

Infect. Immun. 41:1024–1030. tor for zymosan and rabbit erythrocytes as well as a receptor

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the C3bi receptor of human monocytes and macrophages by