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Research Article

Continuous flow mucosal cells for measuring the in-vitro permeability of small tissue samples

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Abstract

Continuous-flow chambers are described for the measurement of permeability of small tissue samples. The design incorporates a large-capacity donor chamber to permit adequate loading of the applied compound and a low-volume (0.3 mL) receiving chamber that ensures rapid removal of penetrant at relatively low (1.5 mL/h or less) pumping rates. Different sized support disks allow tissue biopsies as small as 4 mm in diameter to be utilized. Comparisons of flux and permeability constants (K_p) for water across oral mucosa indicate that there was no significant difference between values obtained for 10- and 4-mm biopsies. Comparisons of flux and K_p values for porcine oral mucosa and a synthetic membrane between continuous flow and conventional, side-by-side chambers indicated that the latter values were significantly lower, suggesting stasis and inefficient removal of perfusate in the side-by-side design. The K_p values for water obtained in the continuous-flow chambers with pig skin were similar to those published elsewhere for human skin.

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