The present review is compendious of different such models or approaches that can be used for designing and evaluation of formulations for nail delivery with special reference to antifungal agents.

Zhao, Y. et al. (2010). "The effects of particle properties on nanoparticle drug retention and release in dynamic minoxidil foams." *Int J Pharm* 383(1–2):277–284.

Nanocarriers may act as useful tools to deliver therapeutic agents to the skin. However, balancing the drug–particle interactions; to ensure adequate drug loading, with the drug–vehicle interactions; to allow efficient drug release, presents a significant challenge using traditional semi-solid vehicles. The aim of this study was to determine how the physicochemical properties of nanoparticles influenced minoxidil release pre and post dose application when formulated as a simple aqueous suspension compared to dynamic hydrofluoroalkane (HFA) foams. Minoxidil loaded lipid nanoparticles (LN, 1.4 mg/mL, 50 nm) and polymeric nanoparticles with a lipid core (PN, 0.6 mg/mL, 260 nm) were produced and suspended in water to produce the aqueous suspensions. These aqueous suspensions were emulsified with HFA using pluronic surfactant to generate the foams. Approximately 60% of the minoxidil loaded into the PN and 80% of the minoxidil loaded into the LN was released into the external aqueous phase 24 hours after production. Drug permeation was superior from the PN, i.e., it was the particle that retained the most drugs, irrespective of the formulation method. Premature drug release, i.e., during storage, resulted in the performance of the topical formulation being dictated by the thermodynamic activity of the solubilized drug not the particle properties.

Zhou, Y. et al. (2014). "Application of a continuous intrinsic dissolution–permeation system for relative bioavailability estimation of polymorphic drugs." *Int J Pharm* 473(1–2):250–258.

A new continuous dissolution–permeation system, consisting of an intrinsic dissolution apparatus and an Ussing chamber, was developed for screening and identification of high-bioavailability polymorphisms at preformulation stages. Three different solid forms of two model drugs (agomelatine and carbamazepine) were used to confirm the system's predictive ability. Ranks for cumulative permeation of the three solids were: Form III > Form I > Form II for agomelatine, and Form III > Form I > the dihydrate form for carbamazepine. Regression analysis of these parameters and published pharmacokinetics confirmed linear IVIVCs (most correlation coefficients > 0.9). To confirm dissolution–absorption relationships, permeability coefficients were calculated. Relatively constant values among various polymorphisms for each drug supported a linear dependency between polymorphism-increased dissolution and polymorphism-enhanced permeation. A combined analysis of intrinsic dissolution rates and permeability coefficients revealed that both drugs are of the BCS II class and have dissolution-limited absorption. In conclusion, our new system was valuable not only for high-bioavailability polymorphism screening, but also for drug classification within the BCS system.