

Supplementary Appendix. *Materials and Methods used in studying dandruff and seborrheic dermatitis*

*Symptoms and signs.* Symptoms such as pruritus, stinging/burning, dryness and tightness are generally assessed via self-perception questionnaires utilizing various scales of severity. Signs such as flaking and erythema are most often assessed by an expert grader calibrated in a pre-defined numerical severity scale in double blinded clinical studies. Such assessments of the scalp are frequently done in surface subdivisions with a cumulative score reported.

*Structure and function.* Functional assessments are frequently made by instrumental evaluation, often re-applying methodologies from skin care research. Skin assessment tools such as trans-epidermal water loss (TEWL), surface conductivity, laser doppler velocimetry usually require alterations to avoid hair interference, either a modification to the probe or partial removal of hair (being careful to not disturb the underlying

skin surface). Structural assessments generally require a biopsy sample, which may involve a tape strip for stratum corneum morphological assessment or a punch biopsy for epidermal characterization through histological methods.

*Molecular.* The most useful approach generates samples via non-invasive sampling methods, enabling their use for large clinical populations. A well-established (40) method uses D-Squame® tapes (CuDerm; Dallas TX) collected from each subject in a study at baseline and subsequent time points during treatment. The sampling site at baseline is identified by an expert as a lesional site, which is noted and returned to for subsequent samples. The tape samples are collected by exposing the scalp skin by parting the hair, placing the tape in the exposed area and rubbing repeatedly with a blunt instrument before removal. Tapes are analyzed either by chemical or immunological methods, depending on the analyte of interest. Commonly, the measured analyte is normalized to separately quantified total protein to account for differences in surface skin removal.