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# Advancing Psoriasis Drug Development

## Trusted *In Vivo* Models and Research Services

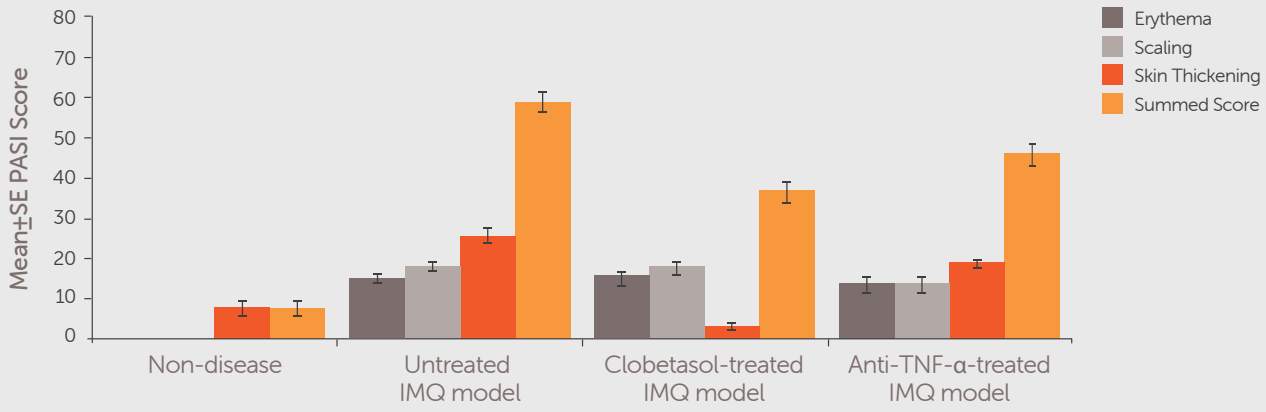
Psoriasis is a chronic inflammatory skin disease affecting millions globally. Existing treatments often offer only partial relief and may come with adverse effects. It is crucial to discover new treatments that better target the underlying immune dysregulation and provide long-term disease control.

### Psoriasis Models

*In vivo* models of psoriasis replicate the complex interactions between the immune system and skin tissue observed in human disease. These models are crucial for drug discovery, as they enable scientists to evaluate the effects of novel treatments on both inflammation and skin pathology. Inotiv offers contract research services that utilize established mouse models of psoriasis to evaluate the efficacy of new therapeutics.

- **IL-23-induced model** The IL-23 murine model of psoriasis utilizes the inflammatory properties of IL-23 to create psoriatic-like lesions in mouse skin.
- **Imiquimod (IMQ)-induced model** IMQ is a toll-like receptor 7/8 agonist that can be applied topically to the skin of wildtype Balb/c or C57bl/6 mice to achieve a psoriasis-like model of skin inflammation (erythema, scaling, and skin thickening).

**Figure 1** Evaluation of Clobetasol and Anti-TNF-α Antibody on PASI Scores of IMQ-Induced Psoriasis Models




Psoriasis was induced in female Balb/c mice by IMQ application. During an 8-day study, mice were treated with either Clobetasol (0.05%, TOP, QD, days 1-7; n=8), an anti-TNF-α antibody (0.5 mg/mouse, i.p., days 1 and 4; n=8), or remained untreated (n=8). The severity and extent of psoriasis plaques were assessed using the Psoriasis Area and Severity Index (PASI) measure. The erythema (dark grey bars), scaling (light grey bars), and skin thickening (red bars) of the plaques, as well as the summed score (orange bars), were compared between the IMQ-induced psoriasis models and non-disease mice (n=4). Positive control Clobetasol effectively attenuated skin thickening, while the anti-TNF-α antibody had limited effect.

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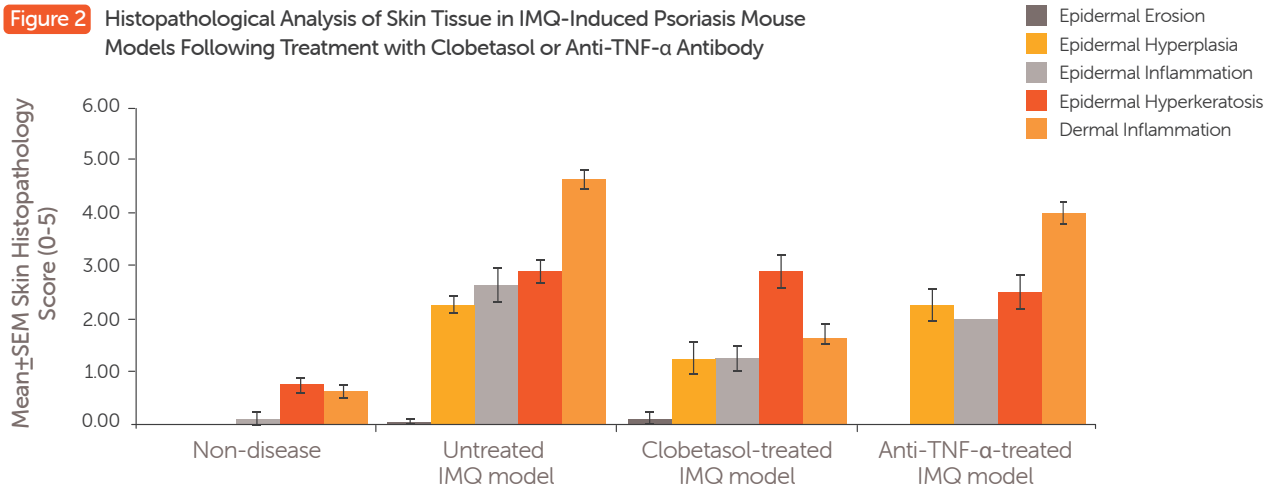
## Histopathological Assessment of Psoriasis Models

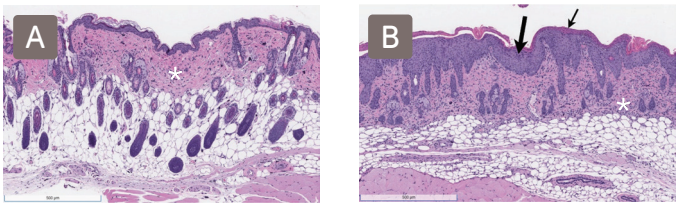
Inotiv delivers comprehensive histopathological services for psoriasis models, conducted by ACVP board-certified pathologists. Our expertise lies in assessing epidermal and dermal inflammation, as well as epidermal hyperplasia, erosion, and hyperkeratosis. These specialized evaluations provide crucial insights into disease progression and the effectiveness of novel therapies.

**Figure 2** Histopathological Analysis of Skin Tissue in IMQ-Induced Psoriasis Mouse Models Following Treatment with Clobetasol or Anti-TNF-α Antibody




IMQ-induced psoriasis mouse models were either treated with Clobetasol (0.05%, TOP, QD, days 1-7; n=8), an anti-TNF-α antibody (0.5 mg/mouse, i.p., days 1 and 4; n=8), or left untreated (n=8). Sections of skin tissue from the IMQ-induced psoriasis models and non-disease mice (n=4) were analyzed for epidermal erosion (dark grey bars), hyperplasia (light orange bars), inflammation (light grey bars), hyperkeratosis (red bars), and dermal inflammation (dark orange bars). Severity of skin histopathology scores increased over the 8-day study and were moderately attenuated by Clobetasol. The anti-TNF-α antibody had limited effect.

**Figure 3** Inflammation and Hyperplasia in Stained Skin Sections from Control and IMQ-Induced Mouse Models




Skin sections, stained with H&E, from a non-disease control animal (A) and an IMQ-induced psoriasis mouse model (B). The control animal shows very minimal dermal inflammation (*) while the IMQ-induced model shows marked epidermal inflammation (small arrow), severe dermal inflammation (*) and moderate epidermal hyperplasia (large arrow).

## Additional Study Endpoints

Demonstrating the efficacy of novel psoriasis therapeutics often requires evaluating additional endpoints. Inotiv's comprehensive capabilities go beyond traditional models and histopathology. We offer customizable *in vivo* and *in vitro* assays tailored to support the specific needs of your psoriasis drug development program.

- Cytokine and chemokine Analysis
- CSC/clinical chemistry analysis
- Mass spectrometry proteomics
- Biomarker/Immune cell analysis with ELISA and Luminex® Assays
- PK/PD blood analysis

**Contact us at inotiv.com/contact to discuss the data you need to assess your therapeutic and how our models and services can support your psoriasis drug development program.**

**Inotiv's capabilities for psoriasis research are powered by its legacy companies, which include:**
***Bolder BioPATH*** *– preclinical pharmacology and pathology CRO |* ***Histotox Labs*** *– routine and specialized histology, immunohistochemistry, histopathology, image analysis/digital pathology |* ***Protypia*** *– protein/peptide bioanalysis |* ***Envigo*** *– research models and related services.*