2D & 3D *in vitro* canine models

CONTEXT & BACKGROUND

Atopic dermatitis (AD) is a skin disease which affects dogs and in particular young dogs.
Altered skin barrier function and differentiation disorders are among the main characteristics of the pathology.

IN VITRO SOLUTIONS

QIMA Life Sciences provides you with 2D and 3D *in vitro* canine models to evaluate the efficacy of your therapeutic products.
We have worked for almost 10 years on the research and development of alternative methods to animal testing for veterinary medicine purposes.

QIMA Life Sciences offers models & assays to evaluate the effect of active compounds on canine AD, skin inflammation and immune responses.

CANINE MODELS: ASSAYS & READOUTS

- Canine whole blood
- Canine 2D & 3D *in vitro* models – primary cells, normal and altered Reconstructed Canine Epidermis
- ELISA / Luminex
- RT-qPCR
- LC/MS
- Immunofluorescence

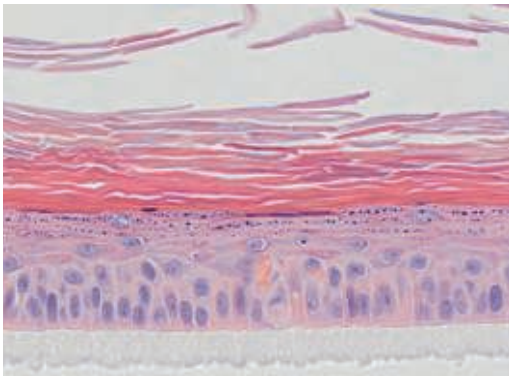
3D *in vitro* models – Unique Reconstructed Canine Epidermis (RCE)

QIMA Life Sciences is the only CRO to offer you the benefits of a reconstructed canine epidermis model. This unique 3D model allows the testing of active ingredients and finished products applied systemically or topically.

We have established an atopic RCE model obtained after stimulation by a specific cocktail of cytokines. This tissue displays several features of canine AD clinical signs: release of inflammatory cytokines (IL-8) and a characteristic phenotype (disorganisation, spongiosis, diminution of keratohyalin granules).

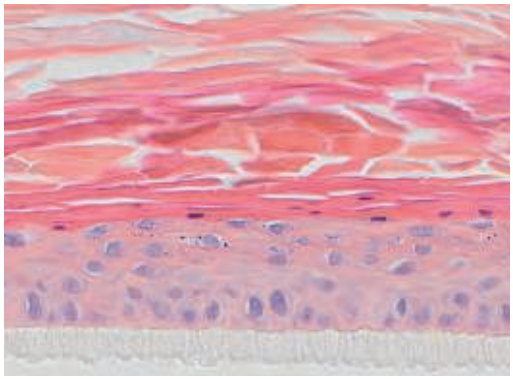
Drugs aimed at treating AD such as small molecules (e.g. JAK inhibitors) or biologics (e.g. anti-IL-4R antibodies) can be evaluated.

Untreated RCE



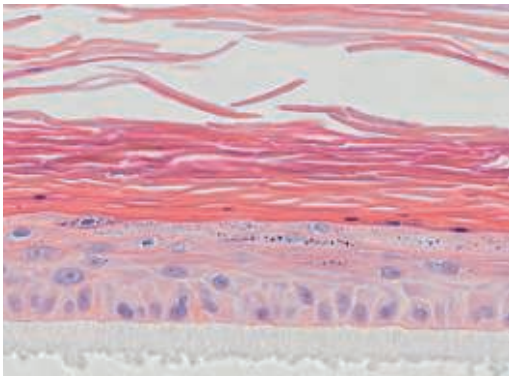
Well differentiated RCE tissue containing keratohyalin granules

RCE + cytokines mix (IL-4 + IL-13 + TNF)



Disorganized basal layer, decreased keratohyalin granules, parakeratosis

RCE + cytokines mix + Oclacitinib



Improved basal layer morphology, increase in keratohyalin granules, decreased parakeratosis

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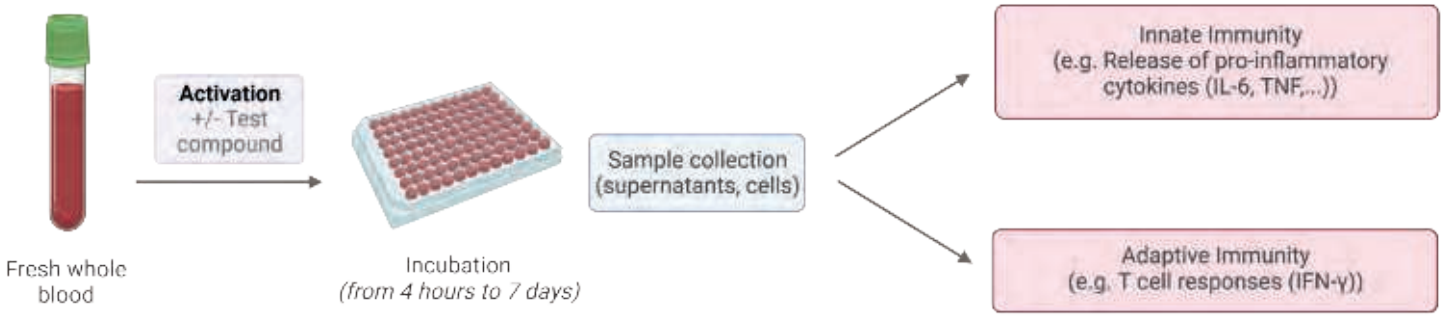
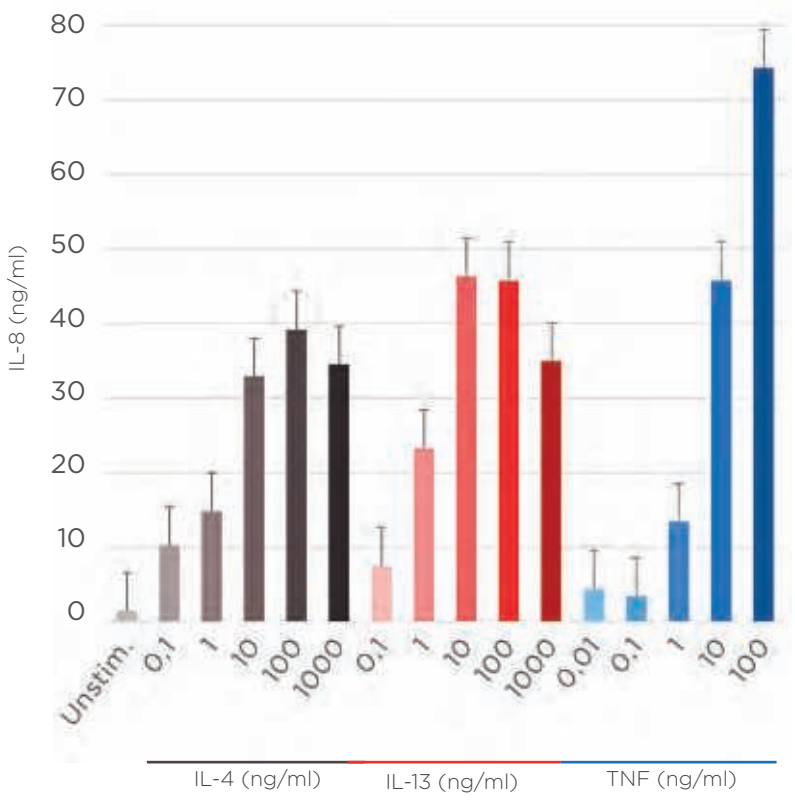
2D *in vitro* models – Primary cells - Fast turnaround times

> Immunomodulation: Fresh whole blood assays have been designed to evaluate immunomodulatory properties of test compounds. Both innate and adaptive immune responses can be assessed. Blood from several dogs can be tested simultaneously in one single experiment, thereby allowing to identify interindividual variations. These assays are adapted to fast turnaround times.

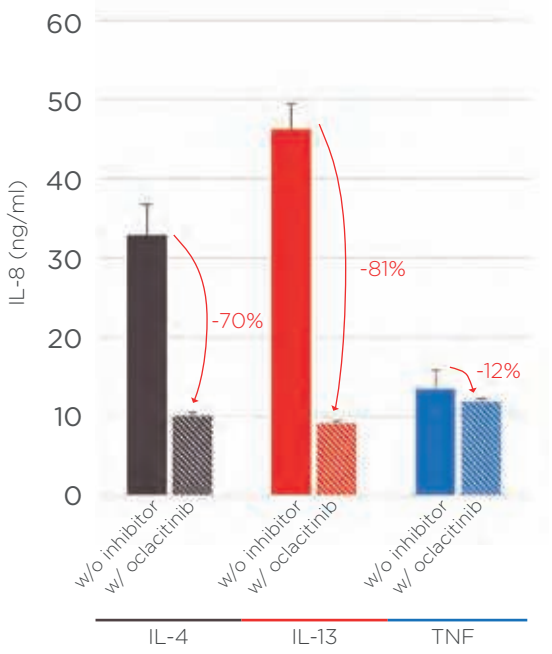


> Skin inflammation: Our 2D model based on the use of primary canine keratinocytes is suitable to assess IL-4, IL-13 or TNF bioactivity, as measured by IL-8 release. Several test compounds, whether small molecules or biologics, can be tested in a single assay with a fast turnaround time.
Active ingredients identified using our 2D model can be further characterized with our 3D model (RCE).

Dose dependent release of IL-8 by primary canine keratinocytes in response to IL-4, IL-13 or TNF



Inhibition of IL-4-, IL-13- or TNF-induced IL-8 release in primary canine keratinocytes by 2 µM oclacitinib



JAK inhibitor Oclacitinib inhibited IL-4- and IL-13- but not TNF-induced IL-8 release

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