**Advancing Cruelty-Free Pharmaceutical Testing: Using the Chick Chorioallantoic Membrane (CAM) to Evaluate Orodispersible Films (ODFs)**

Jiao Jin 1, Karolina Dziemidowicz 1, Samuel Aspinall 2, Conor McCann 3, Catherine Tuleu 1

1 UCL School of Pharmacy, University College London, London, United Kingdom.

2 School of Life and Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom.

3 Great Ormond Street Institute of Child Health, University College London, London, United Kingdom.

Background and aims. The Hen’s Egg Test on the Chorioallantoic Membrane (HET-CAM) is a validated alternative to traditional in vivo irritation tests, such as the Draize rabbit eye test. The chick CAM, resembling the human buccal membrane but lacking a mucus layer, shows potential not only for irritation testing but also for evaluating mucoadhesion and film disintegration time. This study assesses its potential for measuring mucoadhesion, film disintegration, and irritancy, while correlating results with human sensory data to validate its relevance as a human-centric model.

Methods. ODFs were formulated using OrPhyllo™ (Fagron) via solvent casting and included quinine hydrochloride (a model bitter compound) and sucralose (a taste-masking agent). A single-center, single-blind crossover sensory study was conducted (UCL Ethical approval Project ID: 4612/039). A novel CAM-bovine submaxillary mucin (CAM-BSM) system was developed to ethically and reproducibly evaluate mucoadhesion, replacing traditional use of excised bovine tissues (TA.XT.Plus texture analyzer). Disintegration was assessed using three cruelty-free platforms: CAM, Petri dish, and an in vitro Oral Cavity Model (OCM). Irritation potential was evaluated using the HET-CAM assay.

Results. The CAM-BSM model yielded more reproducible mucoadhesion data compared to excised bovine tongue tissue, underlining its applicability. Disintegration times varied by method: within 1 minute for CAM and Petri dish tests, and under 150 seconds in the OCM. Human sensory results confirmed a comparable disintegration time (1–2 minutes). The HET-CAM assay demonstrated minimal irritation potential for all tested films.

Conclusion/Discussion. The CAM model offers valuable insights into the mucoadhesion, disintegration, and irritancy of ODFs by effectively simulating the mucosal environment. This supports its broader use in pharmaceutical ODF development and promotes the advancement of the 3Rs principles and cruelty-free testing methods.

References:

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