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A Comparative Study of Airflow and Odorant Deposition in the Mammalian Nasal Cavity JOSEPH RICHTER, CHRISTOPHER RUMPLE, ALLISON RANSLOW, ANDREW QUIGLEY, Penn State University, BENISON PANG, University of California, Los Angeles, THOMAS NEUBERGER, MICHAEL KRANE, Penn State University, BLAIRE VAN VALKENBURGH, University of California, Los Angeles, BRENT CRAVEN, Penn State University — The complex structure of the mammalian nasal cavity provides a tortuous airflow path and a large surface area for respiratory air conditioning, filtering of inspired contaminants, and olfaction. Due to the small and contorted structure of the nasal turbinals, nasal anatomy and function remains poorly understood in most mammals. Here, we utilize high-resolution MRI scans to reconstruct anatomically-accurate models of the mammalian nasal cavity. These data are used to compare the form and function of the mammalian nose. High-fidelity computational fluid dynamics (CFD) simulations of nasal airflow and odorant deposition are presented and used to compare olfactory function across species (primate, rodent, canine, feline, ungulate).

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