



Cover: The ulnar-mammary syndrome (UMS) gene, *Tbx3*, is required for development of a subset of forelimb muscles. Lateral triceps and brachialis muscles (in purple) develop aberrantly (bottom) when *Tbx3* is genetically deleted in mouse in the lateral plate mesoderm, from which muscle connective tissue and bone eminences are derived, as compared with control (top). Although UMS was thought to affect only bones in the limb, muscle defects similar to the mouse model are also present in a UMS patient. Whole-mount immunofluorescence of E14.5 mouse forelimbs with myofibers in red, tendons in green, imaged on a confocal, and rendered with Fluorender. See article by Colasanto et al. on page 1257. Cover image by M. P. Colasanto is licenced under a Creative Commons Attribution 4.0 International licence.

EDITORIAL

- 1241 Drug screening using model systems: some basics
Cagan, R.

REVIEW

- 1245 Preclinical models for obesity research
Barrett, P., Mercer, J. G. and Morgan, P. J.

RESEARCH ARTICLES

- 1257 Development of a subset of forelimb muscles and their attachment sites requires the ulnar-mammary syndrome gene *Tbx3*
Colasanto, M. P., Eyal, S., Mohassel, P., Bamshad, M., Bonnemann, C. G., Zelzer, E., Moon, A. M. and Kardon, G.
- 1271 Insulin receptor isoform A ameliorates long-term glucose intolerance in diabetic mice
Diaz-Castroverde, S., Gómez-Hernández, A., Fernández, S., García-Gómez, G., Di Scala, M., González-Aseguinolaza, G., Fernández-Millán, E., González-Rodríguez, Á., García-Bravo, M., Chambon, P., Álvarez, C., Perdomo, L., Beneit, N., Escribano, O. and Benito, M.
- 1283 Upregulation of the *Nr2f1-A830082K12Rik* gene pair in murine neural crest cells results in a complex phenotype reminiscent of Waardenburg syndrome type 4
Bergeron, K.-F., Nguyen, C. M. A., Cardinal, T., Charrier, B., Silversides, D. W. and Pilon, N.
- 1295 Immortalized Parkinson's disease lymphocytes have enhanced mitochondrial respiratory activity
Annesley, S. J., Lay, S. T., De Piazza, S. W., Sanislav, O., Hammersley, E., Allan, C. Y., Francione, L. M., Bui, M. Q., Chen, Z.-P., Ngoei, K. R. W., Tassone, F., Kemp, B. E., Storey, E., Evans, A., Loesch, D. Z. and Fisher, P. R.
- 1307 *Gli2* gene-environment interactions contribute to the etiological complexity of holoprosencephaly: evidence from a mouse model
Heyne, G. W., Everson, J. L., Ansen-Wilson, L. J., Melberg, C. G., Fink, D. M., Parins, K. F., Doroodchi, P., Ulschmid, C. M. and Lipinski, R. J.
- 1317 Restoration of mutant bestrophin-1 expression, localisation and function in a polarised epithelial cell model
Ugenti, C., Briant, K., Streit, A.-K., Thomson, S., Koay, Y. H., Baines, R. A., Swanton, E. and Manson, F. D.
- 1329 Cartilage damage and bone erosion are more prominent determinants of functional impairment in longstanding experimental arthritis than synovial inflammation
Hayer, S., Bauer, G., Willburger, M., Sinn, K., Alasti, F., Plasenzotti, R., Shvets, T., Niederreiter, B., Aschauer, C., Steiner, G., Podesser, B. K., Smolen, J. S. and Redlich, K.
- 1339 Pharmacological treatment and BBB-targeted genetic therapy for MCT8-dependent hypomyelination in zebrafish
Zada, D., Tovin, A., Lerer-Goldshtein, T. and Appelbaum, L.
- 1349 HSV presence in brains of individuals without dementia: the TASTY brain series
Olsson, J., Lövheim, H., Honkala, E., Karhunen, P. J., Elgh, F. and Kok, E. H.
- 1357 Photoperiod induced obesity in the Brandt's vole (*Lasiopodomys brandtii*): a model of 'healthy obesity'?
Liu, X.-Y., Yang, D.-B., Xu, Y.-C., Gronning, M. O. L., Zhang, F., Wang, D.-H. and Speakman, J. R.
- 1367 Function of *Ltbp-4L* and fibulin-4 in survival and elastogenesis in mice
Bultmann-Mellin, I., Essers, J., van Heijningen, P. M., von Melchner, H., Sengle, G. and Sterner-Kock, A.
- 1375 Acute and long-term outcomes in a *Drosophila melanogaster* model of classic galactosemia occur independently of galactose-1-phosphate accumulation
Daenzer, J. M. I., Jumbo-Lucioni, P. P., Hopson, M. L., Garza, K. R., Ryan, E. L. and Fridovich-Keil, J. L.
- 1383 Inhibition of vascular endothelial growth factor signaling facilitates liver repair from acute ethanol-induced injury in zebrafish
Zhang, C., Ellis, J. L. and Yin, C.

RESOURCE ARTICLES

- 1397 High- and ultrahigh-field magnetic resonance imaging of naïve, injured and scarred vocal fold mucosae in rats
Kishimoto, A. O., Kishimoto, Y., Young, D. L., Zhang, J., Rowland, I. J. and Welham, N. V.
- 1405 An *in vitro* model of murine middle ear epithelium
Mulay, A., Akram, K. M., Williams, D., Armes, H., Russell, C., Hood, D., Armstrong, S., Stewart, J. P., Brown, S. D. M., Bingle, L. and Bingle, C. D.