



**Cover:** This special issue discusses the biomechanics of swimming and flight, ranging from the flow patterns of larval fish (bottom image; see article by Müller et al., pp. 196–205) and the aerodynamics of insect flight (top image; see article by Aono et al., pp. 239–257) to the kinematics of fish fins and the performance of flapping bird wings. With sections dedicated to motor systems and general fluid dynamic approaches, we offer a snapshot of the current state of fluid locomotion research. Images courtesy of Hao Liu and Ulrike Müller.

### Inside JEB

**Biomechanics of swimming and flight i; Muscle in locomotion i; Biomechanics of swimming ii; Biomechanics of flight ii; General fluid dynamic approaches iii; Summary iii**

### Editorial

**van Leeuwen, J. L. and Biewener, A. A.** Biomechanics of swimming and flight. 163

### Motor systems

**Kier, W. M. and Schachat, F. H.** Muscle specialization in the squid motor system. 164–169

**Tobalske, B. W. and Biewener, A. A.** Contractile properties of the pigeon supracoracoideus during different modes of flight. 170–179

**Tanner, B. C. W., Regnier, M. and Daniel, T. L.** A spatially explicit model of muscle contraction explains a relationship between activation phase, power and ATP utilization in insect flight. 180–186

### Biomechanics of swimming

**Tytell, E. D., Standen, E. M. and Lauder, G. V.** Escaping Flatland: three-dimensional kinematics and hydrodynamics of median fins in fishes. 187–195

**Müller, U. K., van den Boogaart, J. G. M. and van Leeuwen, J. L.** Flow patterns of larval fish: undulatory swimming in the intermediate flow regime. 196–205

**Bandyopadhyay, P. R., Beal, D. N. and Menozzi, A.** Biorobotic insights into how animals swim. 206–214

### Biomechanics of flight

**Spedding, G. R., Hedenström, A. H., McArthur, J. and Rosén, M.** The implications of low-speed fixed-wing aerofoil measurements on the analysis and performance of flapping bird wings. 215–223

► **Lehmann, F.-O.** When wings touch wakes: understanding locomotor force control by wake–wing interference in insect wings. 224–233

**Wang, Z. J.** Aerodynamic efficiency of flapping flight: analysis of a two-stroke model. 234–238

**Aono, H., Liang, F. and Liu, H.** Near- and far-field aerodynamics in insect hovering flight: an integrated computational study. 239–257

► **Taylor, G. K., Bacic, M., Bomphrey, R. J., Carruthers, A. C., Gillies, J., Walker, S. M. and Thomas, A. L. R.** New experimental approaches to the biology of flight control systems. 258–266

### General fluid dynamic approaches

**Lentink, D., Muijres, F. T., Donker-Duyvis, F. J. and van Leeuwen, J. L.** Vortex-wake interactions of a flapping foil that models animal swimming and flight. 267–273

**Techet, A. H.** Propulsive performance of biologically inspired flapping foils at high Reynolds numbers. 274–279

**Peng, J. and Dabiri, J. O.** An overview of a Lagrangian method for analysis of animal wake dynamics. 280–287

► Review article