Chapter 19
The Suitability of Fishes as Models for Studying Appetitive Behavior in Vertebrates

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Abstract Fish have proven to be valuable models in the study of the endocrine control of appetite in response to peripheral signals of energetic and nutritional status. In parallel, a growing body of literature points to the importance of sensory experiences as factors affecting food choice in fish, with a special focus on visual and chemical signals allowing discrimination of potential foods within a 3D environment. Accordingly, waterborne compounds, such as monosaccharides or amino acids, are regarded as the main "olfactory" cues driving fish alimentary behavior. However, we recently suggested that hydrophobic molecules also allow food identification in aquatic environments and that fish actually explore a larger variety of chemosensory cues, including the olfactory/volatile compounds, when determining food palatability. In this study, we show that both homeostatic and chemosensory mechanisms involved in food intake are highly conserved in vertebrates and that the chemosensory world of fish is less different from that of terrestrial mammals than commonly thought. As a result, we support a more integrated and synthetic view of the mechanisms of chemical communication in both terrestrial and aquatic systems, which could help to ensure greater translatability of the fish models, such as the zebrafish (*Danio rerio*), the turquoise killifish (*Nothobranchius furzeri*), the goldfish

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