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Developmental Challenges of Xenoestrogens on Cardiac Development

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The endocrine system plays a crucial in the survival of an organism. It regulates many signaling processes involved in controlling the central nervous system, cardiovascular, immune as well as the reproductive system. Apart from its role in maintaining the functions of major organ systems, signaling by the endocrine system is critical for normal development. For example, estrogen signaling has been shown to regulate cellular physiology by influencing its proliferation rate. With the diverse array of pathways that the endocrine system regulates, disruption by exogenous agents can impair vital functions in not just the cellular and organismal level, but also at the population level. The integrated role of various biological systems and the interaction between these organs can present many difficulties in assessing the effects of endocrine disrupting compounds (EDCs). Adding to the challenges of studying the effects of EDCs during development is the lack of a thorough understanding of the complex series of signaling events that occur in a precise spatio-temporal manner during embryogenesis. However, using model organisms with a well characterized developmental pattern such as zebrafish can facilitate the study of EDCs on physiological endpoints with apical relevance, such as cardiovascular development. Consequently, this review will focus on the developmental challenge of xenoestrogen exposure on cardiac development in aquatic organisms.