Researchers at the Texas A&M Health Science Center (TAMHSC) Institute of Biosciences and Technology in Houston have found a microRNA (miRNA) mechanism underlying normal heart development, thereby revealing a potential method to treat congenital heart disease.

MicroRNAs are small RNAs (a constituent of all living cells and many viruses) that have a profound and essential effect on gene regulation by blocking protein production within the cell. Unfortunately, the signals regulating miRNA expression are poorly understood.

In the Dec. 14 issue of Developmental Cell, James Martin, M.D., Ph.D., professor and interim director of the Center for Molecular Disease and Development in the TAMHSC-Institute of Biosciences and Technology, and his colleagues found that Bone morphogenetic protein (Bmp) signaling regulates miRNA activity to turn off genes normally found in the immature heart as a way to promote normal heart development. Bmp signaling controlled synthesis of a miRNA cluster known as miRNA-17-92. Mice lacking Bmp signaling had lower levels of miRNA-17-92 and elevated levels of genes normally found in the immature heart.

The finding could help in developing treatments for congenital heart disease, a problem with the heart’s structure and function due to abnormal heart development before birth.

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The Texas A&M Health Science Center provides health education, outreach and research through its colleges and campuses in Bryan-College Station, Dallas, Temple, Houston, Round Rock, Kingsville, Corpus Christi and McAllen.

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