

## CE-10

**Hyposmotic Cell Stretch Increases L-type Calcium Current in Smooth Muscle Cells of the Human Stomach**

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Stretch-activated ion channel that is open by mechanical stress applied on the cell membrane is one of the classes of ion channels. Other than stretch-activated channel itself, it has been also reported that a variety of ion channels could be modulated by a mechanical cell stretch. After meal, wall of the stomach is severely distended by the food that elicits a mechanical stress on smooth muscle cells of the gastric wall. Rhythmic contraction of the gastric wall is elicited by the periodic membrane depolarization (slow waves) of the smooth muscle cells. During the plateau phase of the slow waves, L-type Ca-channels open and lead muscle contraction. Here, we tested whether the Ca-channels present in smooth muscle cells of the human stomach is modulated by mechanical cell stretch. Effects of cell stretch by hyposmotic solution on voltage-activated Ba<sup>2+</sup> current (I<sub>Ba</sub>) through L-type Ca-channel was investigated using the conventional whole cell patch-clamp technique. Hyposmotic superfusate induced cell swelling and increased I<sub>Ba</sub>. Increase of the current by cell stretch was reversible, and was dependent on the extent of cell stretch. Cell stretch increased Ca-current without significant changes in the steady-state activation and the inactivation curves. After the treatment of L-type Ca-channel agonist, Bay K 8644 (0.1 μM to 4 μM), the extent of I<sub>Ba</sub> increase by stretch was significantly attenuated, that indicates a population of a new channels are not expressed after cell stretch. These results indicate that L-type Ca-channel is directly modulated by the mechanical stretch of cell membrane. Mechanisms of the mechano-transduction remains elucidated.