



## Arterial Interstitial Cells of Cajal - Minireview

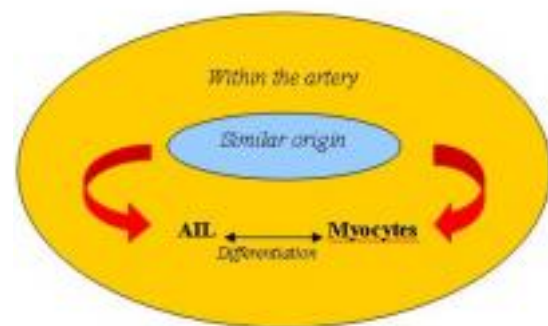
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Interstitial cells of Cajal, frequently abbreviated to Interstitial cells of Cajal, were first identified in the intestinal tract, and similar cells were later subsequently found in other organs namely; the colon, oesophagus and stomach (the gastrointestinal tract); the urethra and urinary bladder (the urinary tract); and in the portal vein (Povstyan et al 2003). Although Povstyan and his colleagues' observation of the Interstitial cells of Cajal like cells in the portal vein was the first of its kind involving the vasculature, Pucovsky et al, in 2003, examined cells resembling Interstitial cells of Cajal in the resistance arteries. They aptly called them arterial Interstitial cells of Cajal-like cells (AIL).

AIL have been found to be multipolar and elongated with numerous occasional thin branches. Located in the vessel wall, AIL are specifically found in the layer of media immediately under the basal lamina and scattered among the myocytes in the deeper layers of media. This localization of AIL cells suggests that the cells are not involved as intermediaries in neural transmission like the Interstitial cells of Cajal in the intestine. Moreover, AIL did not stain positive for the c-kit staining, a common marker for Interstitial cells of Cajal (Bobryshev 2005). Nevertheless, although universally accepted as the best marker for Interstitial cells of Cajal like cells, other c-kit negatives were observed with Interstitial cells of Cajal-like cells in the urethra of the rabbit. This clearly suggests that the marker is dependent on tissues and source of species (Sergeant et al 2000).

Pucovsky et al in 2003 used different types of marker to identify AIL cells, but none of them were able to differentiate them from myocytes. They concluded that this indicates that AIL cells and myocytes are derived from similar origins. This is also evident from their similar ultrastructure, membrane current, and outward current. They both have smooth muscle myosin, vimentin and desmin filaments (Morita et al 1999). Both also have a voltage-

Fig. 1. Interstitial Cells of Cajal and their relationship to Myocytes



dependent calcium current and employ potassium ions within their outward current (Lu et al 2001). Although structurally and morphologically similar, the differences can be seen from their respective processes. The voltage-dependent inward and outward currents is higher in AIL than in myocytes.

Another reason suggesting that the function of AIL may differ from Interstitial cells of Cajal in the intestine, is that the artery has no need of pacemaker activity. This is because there is already sufficient pressure for blood flow in the arteries, unlike other tissues with low pressure. The authors finally concluded that AIL may act as a reservoir, differentiating either myocytes or Interstitial cells of Cajal in the artery (Reusch et al 1996).

Read Dr. Bobryshev's comment regarding the current status of Arterial Interstitial Cells of Cajal

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