

## **Indigenous Patch Clamp Technique: Design of Highly Sensitive Amplifier Circuit for Measuring and Monitoring of Real Time Ultra Low Ionic Current through Cellular Gates**

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**Abstract :** The importance of Noble prize winning “Patch Clamp Technique” is well documented. However, Patch Clamp Technique is very expensive and hence hinders research in developing countries. In this paper, detection, processing and recording of ultra low current from induced cells by using transimpedance amplifier is described. The sensitivity of the proposed amplifier is in the range of femto amperes (fA). Capacitive-feedback is used with active load to obtain a 20M $\Omega$  transimpedance gain. The challenging task in designing includes achieving adequate performance in gain, noise immunity and stability. The circuit designed by the authors was able to measure current in the range of 300fA to 100pA. Adequate performance shown by the amplifier with different input current and outcome result was found to be within the acceptable error range. Results were recorded using LabVIEW 8.5® for further research.

**Keywords :** drug discovery, ionic current, operational amplifier, patch clamp

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