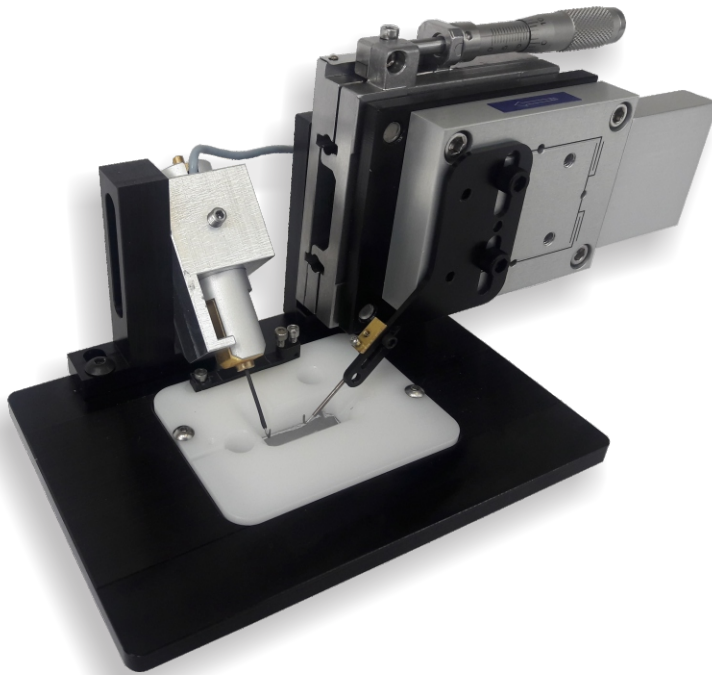


Control and Measure Force in Papillary Muscle



Simultaneously record calcium and force in intact and skinned muscle preparations

Characterize stiffness with precision piezo motor

Stimulate muscle through electrically conductive force transducer

IonOptix Papillary Muscle Chamber

Intact papillary muscle isolated from hearts offers unique advantages over single isolated myocytes. Papillary muscle can be used to study cardiac function within a multicellular context and an intact 3-dimensional myofilament lattice. Unlike whole heart studies, the contractile characteristics of papillary muscle can be evaluated independently of extrinsic factors such as vascular tone, and papillary muscle enables measurements too difficult or impossible to perform in whole hearts.

The new IonOptix Papillary Muscle Chamber has been designed to facilitate these measurements. Intact ventricular papillary muscle can be easily attached between a robust force transducer and programmable length controller. Chamber fluid flow allows for temperature control and continuous oxygenation of tissue, while the specialized force transducer allows for electrical excitation directly through the muscle preparation. Simple platinum "Omega" clips are tied to the muscle ends which then slip onto platinum hooks. The platinum allows for electrical conductance and are inert, preventing electrolysis or disruption of biology.

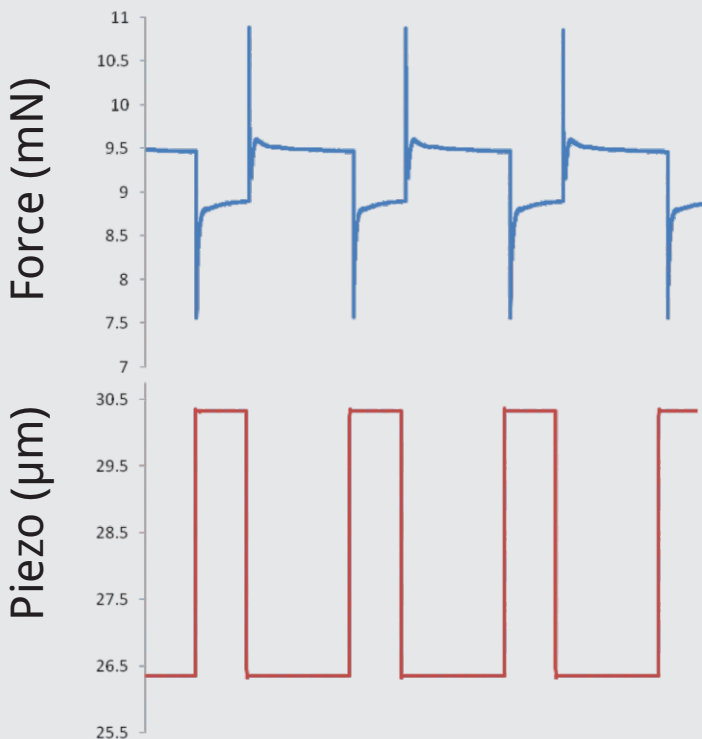
Features

- Sensitivity range: 100 mN (typical, more sensitive force transducers available with 5 mN detection limits)
- System resonant frequency: >500 Hz
- Piezo motor travel: 50 μm
- Piezo motor resolution: 0.10 nm, tuned for fast, accurate steps
- Inert platinum hooks prevent electrolysis and disruption of biology

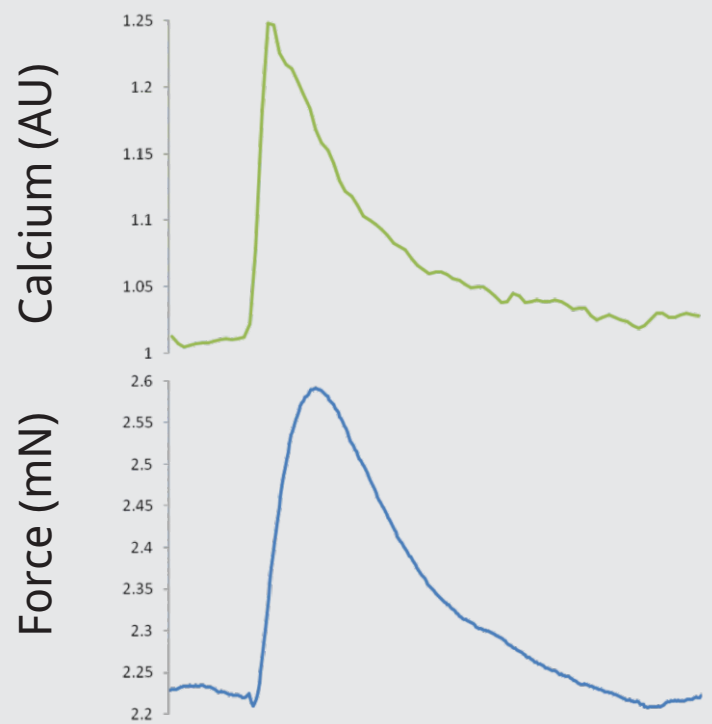
Applications

This chamber is designed to be used for excitable muscles up to 2 cm in length:

- Cardiac papillary muscle of many species (mouse, rat, rabbit, cat, dog, pig)
- Cardiac endocardial strips or trabeculae (mouse, rat, rabbit, cat, dog, pig)
- Cardiac epicardial strips (mouse, rat, rabbit, cat, dog, pig, human)
- Skeletal muscles, e.g., soleus, extensor digitorum longus (EDL), gastrocnemius, cremaster (mouse, rat)



Stretch response of skinned papillary muscle.



Calcium (Fura-2 ratio) and force in soleus muscle.