

Accepted Manuscript

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PII: S1084-9521(16)30495-5
DOI: <http://dx.doi.org/doi:10.1016/j.semcdb.2017.07.003>
Reference: YSCDB 2266

To appear in: *Seminars in Cell & Developmental Biology*

Received date: 30-5-2017
Revised date: 29-6-2017
Accepted date: 3-7-2017

Please cite this article as: Borin Daniele, Pecorari Ilaria, Pena Brisa, Sbaizero Orfeo. Novel insights into cardiomyocytes provided by atomic force microscopy. *Seminars in Cell and Developmental Biology* <http://dx.doi.org/10.1016/j.semcdb.2017.07.003>

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Novel insights into cardiomyocytes provided by atomic force microscopy

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HIGHLIGHTS

- Applications of AFM to cardiomyocytes (CMs) have been extensively revised;
- Imaging with AFM allows to resolve subsarcolemmal structures of CMs;
- AFM mechanically characterises physiological and pathological conditions of CMs;
- AFM allows monitoring beating activity and drug effects on single CMs;
- Potential diagnostic and novel applications of AFM on CMs are discussed.

ABSTRACT

Cardiovascular diseases (CVDs) are the number one cause of death globally, therefore interest in studying aetiology, hallmarks, progress and therapies for these disorders is constantly growing. Over the last decades, the introduction and development of atomic force microscopy (AFM) technique allowed the study of biological samples at the micro- and nanoscopic level, hence revealing noteworthy details and paving the way for investigations on physiological and pathological conditions at cellular scale.

The present work is aimed to collect and review the literature on cardiomyocytes (CMs) studied by AFM, in order to emphasise the numerous potentialities of this approach and provide a platform for researchers in the field of cardiovascular diseases. Original data are also presented to highlight the application of AFM to characterise the viscoelastic properties of CMs.

KEYWORDS

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