FLORIDA STATE UNIVERSITY FAMU-FSU COLLEGE OF ENGINEERING

METABOLISM AND REDOX CYCLE IN HUMAN MESENCHYMAL STEM CELL WITH CULTURE INDUCED SENESCENCE: HOMEOSTASIS AND REJUVENATION

By

XUEGANG YUAN

A Dissertation submitted to the
Department of Chemical and Biomedical Engineering
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

Xuegang Yuan defended this dissertation on March 11, 2019.

The members of the supervisory committee were:

Teng Ma

Professor Directing Dissertation

Timothy M. Logan

University Representative

Samuel C. Grant

Committee Member

Yan Li

Committee Member

The Graduate School has verified and approved the above-named committee members and certifies that the dissertation has been approved in accordance with university requirements.