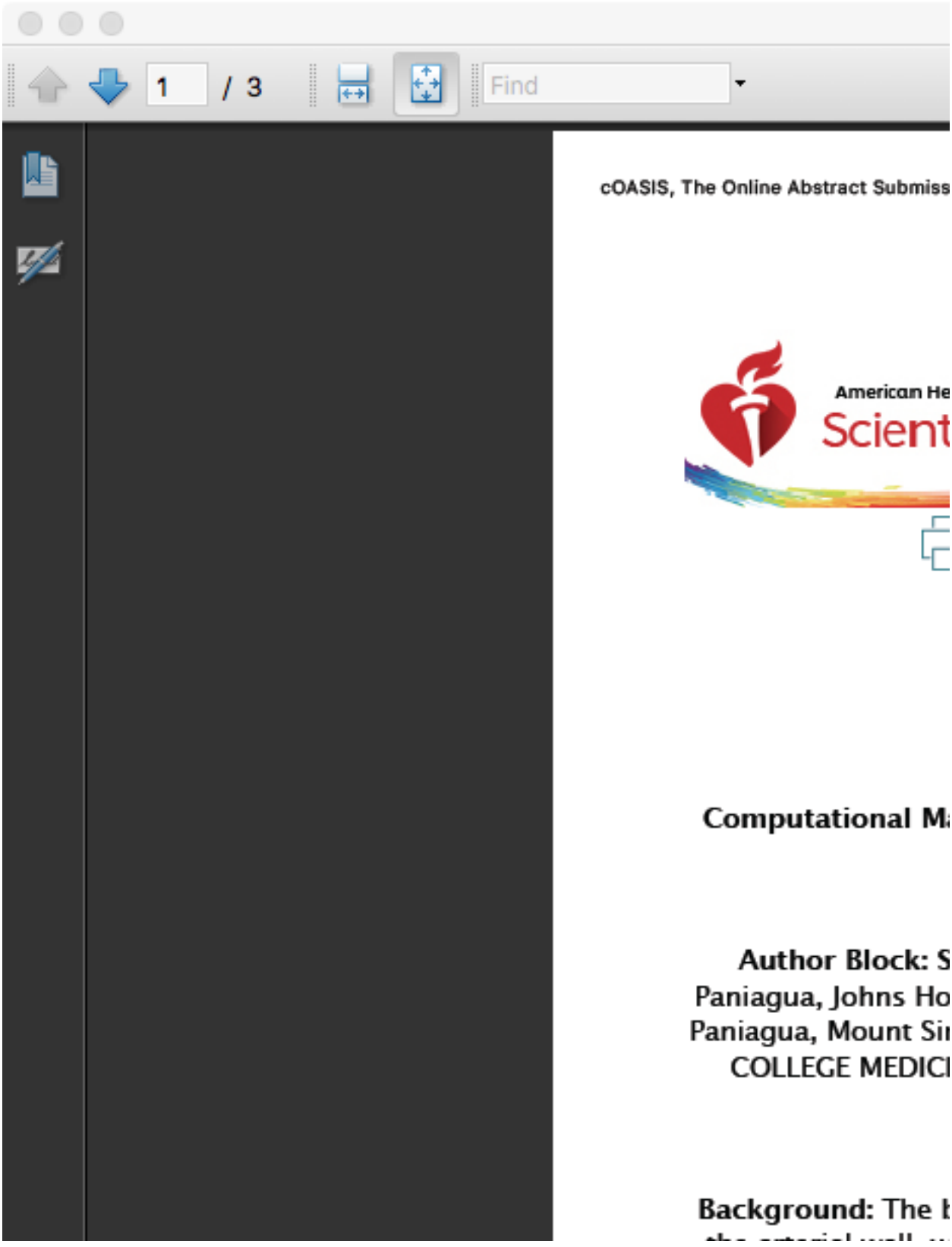
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athematical Analysis Of Different Stent Geometries And Arterial Wa Tortuous Coronary Artery

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pkins, Baltimore, MD; Jonanlis Ramirez, Massachusetts General Hosp, E
ai, Miami Beach, FL; Raymundo Quintana, Emory Med, Atlanta, GA; Ha
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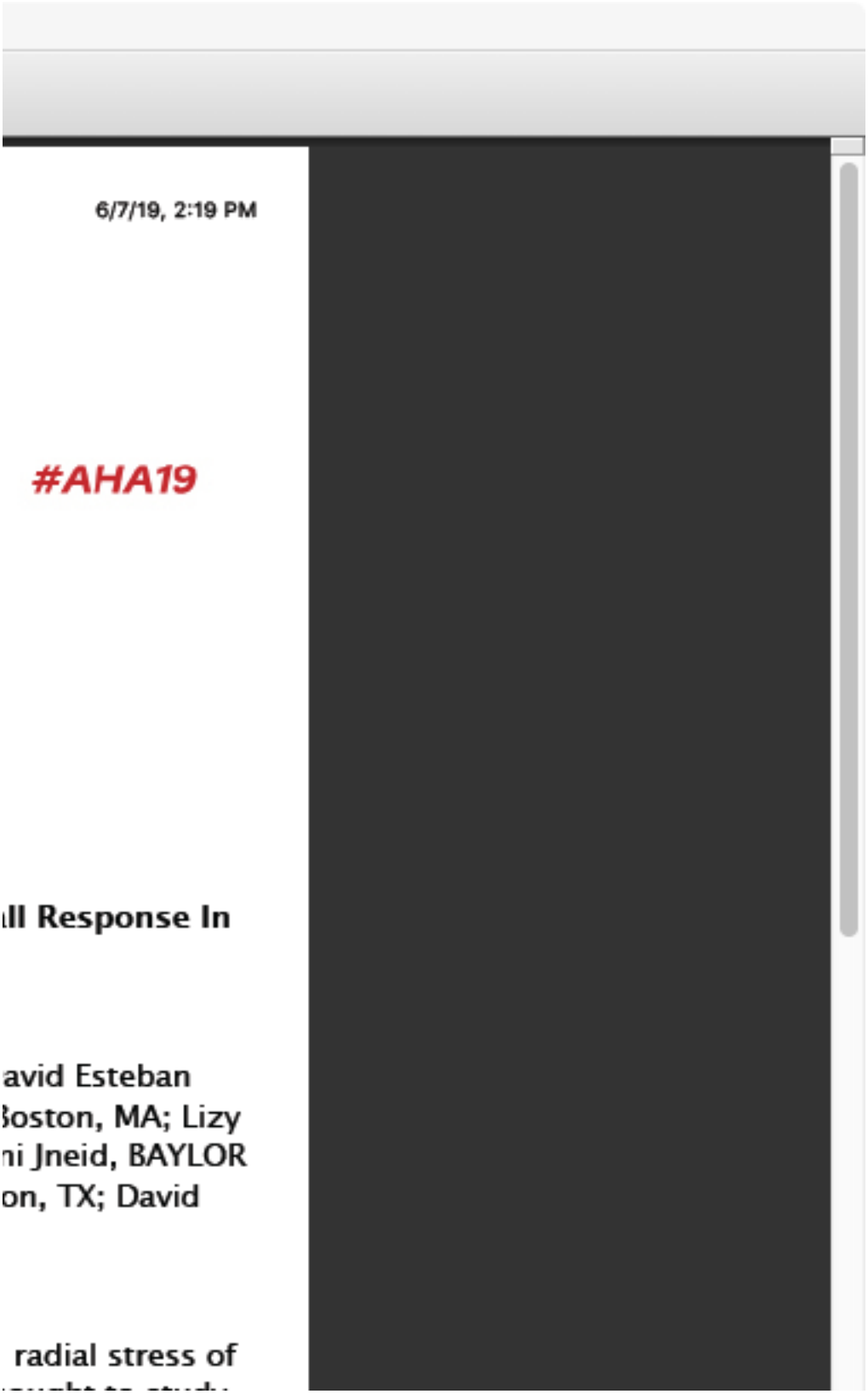
Abstract:

biological response of a coronary artery can be assessed measuring the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Boston, MA; Lizy
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the arterial wall, w
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Methods: A comput
coronary arterial
Frontiers). Arterial
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Results: Intramural
intimal layers we
responses ass
proliferation. The
blood flow thr

Conclusion: The C
Open cell design

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hich depend on the location, arterial tortuosity, and cardiac cycle. We s
nd investigate which geometric distribution of stent struts is associated
biologic response in tortuous coronary arteries.

tational solver was used to study fluid structure interaction between ela
walls and pulsatile coronary blood flow (validated using experimental d
walls were modeled as multi-layered elastic structures consisting of a
ayer. The Navier-Stokes equations were used to model pulsatile blood
eometries were studied: Palmaz, Express, Xience, & Cypher like stent.

von Mises and radial/normal stress experienced by the media-adventi
re used as parameters that indicate high probability for the developme
ociated with in-stent restenosis, neointimal hyperplasia, and smooth m
normal radial stress values obtained by performing the same simulatio
ough the same curved coronary artery before and after the implantatio
stents(Fig.1). The stent with lowest stress is the Cypher.

Cypher stent geometry appears to be superior for the use in tortuous co
and horizontal sinusoidal stent struts contribute to the stent complian
coronary arteries.

sought to study
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flow. Four stent

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ce in tortuous