

# Nitin S. Baliga, MSc, PhD

Professor, Senior Vice President & Director



Dr. Baliga moved to Seattle for postdoctoral training with [Dr. Leroy Hood](#) at the [Institute for Systems Biology](#).

In 2007, Dr. Baliga published a landmark paper<sup>1</sup> that demonstrated how to accurately predict the response of an organism to a new environment. This breakthrough was made possible by a suite of technologies<sup>2-5</sup>, experimental strategies<sup>6-11</sup> and computational tools<sup>12-19</sup> that Dr. Baliga and his team developed to reverse engineer the complete gene regulatory network of a free-living organism. This study uncovered the theory and fundamental principles that underlie the evolution and predictability of biological responses<sup>1,6,20,21</sup>. Applying this approach to environmental issues, Dr. Baliga has discovered how some extremophiles might explore life in a new environment<sup>6,22,23</sup>, revised a >5 decade old "operon" paradigm of gene regulation in prokaryotes<sup>24,25</sup>, discovered diurnal anticipatory behavior in archaea<sup>26</sup>, uncovered the role of programmed cell death in unicellular chlorophytes<sup>27</sup>, elucidated how cells maintain copper ions at a safe concentration<sup>28</sup> and discovered the role of RNases in adaptation to rapid environmental changes<sup>29</sup>. Together with collaborators at the University of Washington, and the Lawrence Berkeley Laboratories, he is now elucidating the biological networks underlying response to [ocean acidification](#), [social interactions](#), and [fuel production](#) in microbes<sup>23,30-34</sup>.

Nitin Baliga [leads a cross-disciplinary team of scientists](#) to address complex problems relevant to global health, personalized medicine, energy, and environment. His team uses a systems approach to construct predictive models of cellular and molecular networks within pathogens, cancer cells, and environmental microbes to enable biotechnologies to overcome drug resistance, find new drugs, predict consequence of climate change, and manufacture biorenewables. Dr. Baliga is also [actively engaged in science education](#), and is passionate about developing and disseminating current science curriculum and authentic cross-disciplinary practices to schools. His contributions to HS education have had worldwide impact, and have won awards including the Alvin J. Thompson award. As a Professor at the Institute for Systems Biology, he was one of the founding members, and currently serves as the [Director and Senior Vice President](#).

Dr. Baliga did his early schooling in Mumbai, India, where he received a B.Sc. in Microbiology (1992) from Ruia College within the Mumbai University system. In 1992, Dr. Baliga entered a national competition and won the highly coveted Central Government of India sponsored Department of Biotechnology studentship, which supported his graduate studies in Marine Biotechnology at Goa University. After getting a M.Sc. in Marine Biotechnology in 1994, Dr. Baliga won the prestigious Council for Scientific and Industrial Research fellowship through another Central Government of India-sponsored national competition. After completing his Ph.D. in Microbiology in 2000 at the University of Massachusetts at Amherst,

Dr. Baliga has also expanded his research program to complex human disease to elucidate dysfunctional networks in cancers<sup>35-37</sup> and the basis for latency, drug tolerance, and altered immune responses in TB infections<sup>38-43</sup>. His work has identified regulatory drivers across multiple cancers<sup>16,35,44</sup>, and are aiding academic organizations and pharmaceutical companies in drug target discovery, drug repositioning, and combinatorial therapeutics. Dr. Baliga's work has been published in top international journals including Cell, Science and Nature. He has been invited to the [Google SciFoo Camp](#), and has been profiled by [The Scientist](#), [Genome Web](#), [Wired Magazine](#), [Genetic Engineering News](#), [Ars Technica](#), [Xconomy](#), and [Nature Methods](#), among many others. Research in Dr. Baliga's laboratory has been supported by the National Science Foundation, National Institutes of Health, NASA, Department of Energy, and the Department of Defense. He is the [Section Editor of BMC Systems Biology](#) and Nature Scientific Data, serves on scientific advisory boards of numerous academic and industrial organizations, and been instrumental in research program planning for the NSF and DOE.

Dr. Baliga has also made transformative contributions to science education. He founded the Systems Education Experiences (SEE) program that has offered internship opportunities to dozens of students and teachers from underrepresented groups and of disadvantaged backgrounds. Science curriculum developed by Dr. Baliga's SEE program has impacted >2 million students in over one hundred countries.

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