



KYLE E
CORDOVA

ABRIDGED CURRICULUM VITAE

Executive Director of Research Enterprise

kyle.cordova@rss.jo

Assistant to HRH Princess Sumaya bint El Hassan
for Scientific Affairs

(+962) 7 9295 6022

Royal Scientific Society,
Amman, Jordan

(+1) 714 350 6334 (WhatsApp)

Fourth Circle, Amman, Jordan

PROFESSIONAL INTERESTS

Democratization of scientific research; global research development; global innovation; STEM education; research capacity building; reticular chemistry; materials, solid-state, inorganic, and organic chemistry; synthesis of metal-organic frameworks and zeolitic imidazolate frameworks; carbon dioxide capture and conversion to fuels; hydrogen and methane storage; water harvesting from air; gas separations and adsorption; heterogeneous catalysis; sequence-dependent chemical structures.

EDUCATION & EMPLOYMENT

- 2006 – 2010 BA, Chemistry and Political Science, Cum Laude, University of San Diego, USA
- 2010 – 2012 MSc, Chemistry, University of California, Los Angeles, USA
- 2012 – 2014 Adjunct Faculty, Department of Chemistry and Biochemistry, San Francisco State University, USA
- 2013 – 2014 Adjunct Faculty, Department of Chemistry and Biochemistry, University of San Francisco, USA
- 2014 – 2016 Global Science Coordinator, Berkeley Global Science Institute, University of California, Berkeley, USA
- 2014 – 2019 Research Affiliate, Lawrence Berkeley National Laboratory, USA
- 2014 – 2019 Research Associate, College of Chemistry, University of California, Berkeley, USA
- 2016 – 2019 Associate Director, Berkeley Global Science Institute, University of California, Berkeley, USA
- 2019 – Assistant to HRH Princess Sumaya bint El Hassan for Scientific Affairs,
Royal Scientific Society, Jordan
- 2020 – Executive Director of Research Enterprise, Royal Scientific Society, Jordan

MENTORING, PUBLICATIONS, CITATIONS & INVITED PRESENTATIONS

- **Mentoring.** Research mentor to >200 PhD, MSc, BSc students, and PhD-holding research scholars at global science centers in Vietnam, Saudi Arabia, South Korea, Japan, China, Malaysia, Indonesia, Jordan, Mexico, and United Arab Emirates.
- **Publications.** Authored over 35 articles in peer-reviewed journals with 5 published in *Science* and *Nature* family journals.
- **Citations.** Over 12,000 citations garnered for published articles. H-index of 25 and i10-index of 30 (Google Scholar Data).
- **Invited Presentations and Workshops Disseminated.** Over 40 invited presentations and 35 workshops delivered worldwide.



GLOBAL SCIENCE INITIATIVES

- 2011 – 2012 Visiting Scholar, Center for Reticular Materials, National Institute for Materials Science, Tsukuba, Japan
- 2011 – 2012 Visiting Scholar, Heterogeneity within Order Group, KAIST, Daejeon, South Korea
- 2014 – 2016 Director of Research, Center for Molecular and NanoArchitectures, Ho Chi Minh, Vietnam
- 2016 – Research Consultant, Saudi Aramco Carbon Capture and Utilization Group, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia
- 2016 – 2019 Researcher, Center of Excellence for Nanomaterials for Clean Energy Applications, King Abdulaziz City for Science and Technology, Riyadh, Saudi Arabia
- 2017 Visiting Professor, Bandung Institute of Technology, Bandung, Indonesia
- 2017-2019 Research Advisor, Foundry of Reticular Materials for Sustainability, University of Putra Malaysia, Putrajaya, Malaysia
- 2019 Research Advisor, Laboratories for Materials Innovation, United Arab Emirates University, Al Ain, United Arab Emirates



PROFESSIONAL ACTIVITIES

- 2014 Executive Organizing Committee, "150 Years of Beautiful Structures and Defects," Ho Chi Minh City, Vietnam
- 2016 – 2019 Principle Director and Coordinator of the Berkeley Emerging Scholars Research Scholars: Laboratory Research Experience Program; globalscience.berkeley.edu/lre
- 2016 Invited Participant, 2nd Steering Committee, "World Science Forum 2017," Royal Scientific Society, Amman, Jordan
- 2017 Sub-Committee on Emerging Scholars/Young Scientists, "World Science Forum 2017," Amman, Jordan
- 2018 International Advisory Committee, "2nd Symposium on Organic and Inorganic Chemistry, Southern Africa," University of Botswana, Gaborone, Botswana
- 2018 Invited Member of the Global Energy Prize Pool of International Experts (Russian Federation)
- 2018 Invited External Reviewer for Deutsche Forschungsgemeinschaft (German Research Foundation)
- 2019 Executive Organizing Committee, "Frontiers in Chemical Research," National Autonomous University of Mexico, Mexico City, Mexico
- 2020 Scientific Advisory Committee Member, Phi Science Institute, Amman, Jordan
- 2020 Selection Panel, "UK – Jordan El Hassan bin Talal Research Chair in Sustainability", British Academy, United Kingdom



SELECTED RESEARCH PUBLICATIONS (COUNTRY WHERE RESEARCH PERFORMED)

- Cordova, K. E. and Yaghi, O. M. Building a Global Culture of Science – The Vietnam Experience, *Angew. Chem. Int. Ed.*, **2019**, *58*, 1552-1560. (Vietnam – United States)

Impact: This essay provides specific details behind the process of establishing an international-competitive research program in a developing country. Through a case-study analysis, the proposed 'global science' model demonstrates its scalability and adaptability to countries beyond Vietnam.

- Diercks, C. S.; Liu, Y.; Cordova, K. E.; Yaghi, O. M. The Role of Reticular Chemistry in the Design of CO₂ Reduction Catalysts. *Nature Mater.*, **2018**, *17*, 301-307. (United States)

Impact: The grand challenge in carbon dioxide reduction processes is the fact that a single catalytic system must control the interplay between efficiency, activity, and selectivity. In this article, we argue that since all of these aspects can be fine-tuned independently through reticular chemistry, reticular materials are the answer for developing the next generation of CO₂ reduction catalysts.

- Trickett, C. A.; Helal, A.; Al-Maythaly, B. A.; Yamani, Z. H.; **Cordova, K. E.**; Yaghi, O. M. The Chemistry of Metal–Organic Frameworks for CO₂ Capture, Regeneration, and Conversion. *Nature Rev. Mater.*, **2017**, *2*, 17045. ****Highlighted on the Front Cover.** (Saudi Arabia – United States)

Impact: Each stage of the carbon cycle – capture, regeneration, and conversion – has its own materials requirements. With this knowledge, we detail the necessity for using the precision of metal-organic framework (MOF) chemistry in building more complex materials to address selectivity, capacity, and conversion in one material.

- Nguyen, H. L.; Gándara, F.; Furukawa, H.; Doan, T. L. H.; **Cordova, K. E.**; Yaghi, O. M. A Titanium–Organic Framework as an Exemplar of Combining the Chemistry of Metal- and Covalent–Organic Frameworks. *J. Am. Chem. Soc.*, **2016**, *138*, 4330–4333. (Vietnam – United States)

Impact: After twenty years of research in reticular chemistry, the true rational design of a metal-organic framework (MOF) was demonstrated. In this report, we presented the step-wise, logical synthesis of a Ti-based MOF. This was accomplished by taking advantage of the unique chemistries of two different classes of materials: MOFs and covalent organic frameworks.

- Nguyen, N. T. T.; Furukawa, H.; Gándara, F.; Trickett, C. A.; Jeong, H.-M., **Cordova, K. E.**; Yaghi, O. M. Three-Dimensional Metal-Catecholate Frameworks and their Ultrahigh Proton Conductivity. *J. Am. Chem. Soc.*, **2015**, *137*, 15394–15397. (Vietnam – United States)

Impact: This report detailed a series of new metal-organic frameworks (MOFs) based on the important catecholate linkage. The chemistry of such linkages was discovered for the first time and the resulting conductive frameworks were demonstrated to be effective in the transport of protons, thereby aiding the development of next generation fuel cells.

- Nguyen, N. T. T.; Furukawa, H.; Gándara, F.; Nguyen, H. T.; **Cordova, K. E.**, Yaghi, O. M. Selective Capture of Carbon Dioxide under Humid Conditions by Hydrophobic Chabazite-Type Zeolitic Imidazolate Frameworks. *Angew. Chem. Int. Ed.*, **2014**, *53*, 10645–10648. ****Highlighted on the Back Cover.** (Vietnam – United States)

Impact: This report detailed the synthesis of hydrophobic ZIFs for selective capture of CO₂ in the presence of water – an important contribution towards realizing practical adsorbents for flue gas purification.

- Furukawa, H.; **Cordova, K. E.**; O’Keeffe, M.; Yaghi, O. M. The Chemistry and Applications of Metal-Organic Frameworks. *Science*, **2013**, *341*, 1230444. (United States)

Impact: This review has proven to be one of the most cited publications in the field of reticular chemistry. It has amassed over 7,000 citations in less than a decade of publication.

- Deng, H.; Grunder, S.; **Cordova, K. E.**; Valente, C.; Furukawa, H.; Hmadeh, M.; Gándara, F.; Whalley, A. C.; Liu, Z.; Asahina, S.; Kazumori, H.; O’Keeffe, M.; Terasaki, O.; Stoddart, J. F.; Yaghi, O. M. Large Pore Apertures in a Series of Metal-Organic Frameworks. *Science*, **2012**, *336*, 1018–1023. ****Highlighted in Chemical and Engineering News.** (United States – Japan)

Impact: We synthesized a series of metal-organic frameworks (MOFs) with pore windows large enough to house proteins (98 angstroms). Up to the point of this publication, the size of MOF pore windows could never surpass 32 angstroms. This discovery opens up possibilities of protein crystallization, drug delivery, and industrially-relevant molecular storage and separation processes.

HONORS, FELLOWSHIPS & AWARDS

2006 – 2010	University of San Diego Presidential Scholar
2007	National Cancer Institute CURE Scholar
2009 – 2010	Ronald E. McNair Scholar
2009 – 2010	Ronald E. McNair Post-Baccalaureate Scholarship Recipient
2014	Vietnam National University – Ho Chi Minh Outstanding Achievement Award for best scientific publication in 2013 – 2014 (Nguyen, N. T. T. et al, <i>Angew. Chem. Int. Ed.</i> , 2014 , <i>53</i> , 10645–10648)
2017	World Science Forum Panel Moderator (‘Emerging Scholars: Establishing the Cycle of Innovation’)
2019	World Science Forum Panelist (‘Aren’t We Wasting Time? Creating a Cooperative Funding Framework for More Responsive Research for Development’)
2021	Leaders in Innovation Fellow, Newton Fund, UK Royal Academy of Engineer
2021	International Union of Pure and Applied Chemistry (IUPAC), US Young Observer