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## Steelcase Teams Up with MIT Researchers to Help Create Safer Workplaces



We are excited to announce a collaboration between Steelcase and MIT professor and disease transmission specialist Dr. Lydia Bourouiba of The Fluid Dynamics of Disease Transmission group at MIT.

We know the vast majority of organizations want to bring people back to the workplace and that environment must be compelling while also being safe. The workplace is essential to drive growth, build culture and fuel innovation. So getting people back into the workplace is critical to help jump start the economy.

Our work with Dr. Bourouiba will help us understand how pathogens travel through enclosed environments like the workplace and how we can design spaces that mitigate the spread of disease, helping people to be safer at work.

We will be working with Dr. Bourouiba to conduct combined laboratory testing and modeling of furniture configurations and materials to determine the best combinations for mitigating the spread of respiratory diseases. The work will happen over a series of phases. Insights will be able to immediately benefit our clients by providing best practices to assist in retrofitting or reconfiguring existing workplaces. We plan to publish our first findings in the next few months.

You can share this story with clients using this link: <https://www.steelcase.com/research/articles/steelcase-bourouiba-research-mit-study-pathogens/>

A sales and dealer FAQ document can be found below and on [Village](#) to provide you with more background for client conversations.

## SALES & DEALERS FAQ

*This document is not intended to be shared publicly. This is intended to provide background on the relationship between Steelcase and MIT's Dr. Lydia Bourouiba.*

### Why is Steelcase interested in studying the transmission of pathogens?

Infection mitigation is a new priority for the office. As employees return to their workplace, they need to feel safe and be safe. Steelcase and MIT will lead the scientific study of pathogen transmission within the workplace. As businesses work towards reestablishing pre-COVID revenue and growth, they will look for smart investments that help shield them from the business loss experienced due to risk of infection transmission. Current solutions and recommendations are still unproven, and businesses are questioning if they are worth pursuing. In our customer roundtables, we heard skepticism around the use of screens, for example. While generally accepted as a strategy to bring people back, there isn't enough science-backed evidence to support their use in the spread of disease – leaving many uncertain and asking what they should do.

### What is the need for infection mitigation in the office?

The workplace was not originally designed to reduce the spread of viruses. We know from a variety of studies (Gensler, Cushman & Wakefield) that 88-90% of people want to come back to the workplace in some way in large part to collaborate with others. But, they also want it to be safe. A Steelcase study asked people how they felt about returning to the office and saw patterns that allowed researchers to put people into three main groups – the largest was people conflicted about returning and worried about safety. At the same time, our data analytics team reviewed thousands of furniture configurations among our global customers and found 98% of seats in the office do not have either 6 ft of distance between the next closest employee or a space divider that is 54 inches high. We need to offer solutions – backed by science.

### Why are we partnering with Dr. Lydia Bourouiba and MIT?

Steelcase has had a long relationship with MIT including work with its Media Lab and Self-Assembly Lab. Dr. Bourouiba is a leading disease transmission specialist and MIT professor. She is also the director of [The Fluid Dynamics of Disease Transmission](#) at MIT. The research group's mission is to better understand and clarify the poorly understood mechanisms of disease transmission through the lens of fluid dynamics (in this case — how pathogens move through air). At Steelcase, we know we need to create safe and compelling workplaces moving forward. Right now, science understands how things like sound, light and water move through air. But, how pathogens travel through space, especially in indoor environments, is

less well-known. By putting numbers to the human experience, we'll be able to better understand the transmission of a virus when someone coughs or speaks in the office.

### **What's Dr. Lydia Bourouiba's background?**

Dr. Bourouiba is a physical applied mathematician focused on fluid dynamics and disease transmission. Her research on fluid dynamics has helped inform COVID-19 policies and her 2018 TEDMED talk has been viewed more than 12,000 times. The Fluid Dynamics of Disease Transmission at MIT uses a combination of theoretical (applied mathematics, including differential equations, linear algebra, nonlinear dynamics, waves and stability) and experimental approaches (flow visualization, high speed imaging techniques, microscopy, image processing) to study disease transmission.

### **What is computational fluid dynamics and what does Dr. Bourouiba study?**

Fluid dynamics is the branch of applied science that is concerned with the movement of liquids and gases. Dr. Bourouiba uses her background in applied mathematics to create numerical (computational) models – essentially an equation – that describes the behavior of a forceful exhalation from someone in a work environment (a cough). This modeling takes into account how much force, vapor and kinds of droplets are in the vapor, among other things.

### **How is this different from other scientific studies we have read about?**

Current models are not sufficiently detailed enough. Dr. Bourouiba's models take into account multiple things that happen in a dynamic situation like a cough. For example, droplets may rise, then fall, then rise again as someone moves through an environment. Other models do not tell the whole story. To find the best solutions for the work environment, we need the best models.

### **What will Steelcase and The Fluid Dynamics of Disease Transmission group study together?**

Steelcase will be working with Dr. Bourouiba to conduct laboratory testing on furniture configurations and materials to determine the best combinations for mitigating the spread of droplets and aerosols. Dr. Bourouiba will use what she learns to modify her existing model to create a repeatable process that will allow us to add physical barriers or other furniture configurations into the work environment and understand what is most effective at mitigating the spread of disease.

The work will happen over a series of phases beginning with evaluating current configurations to determine how density (the number of people in a space), geometry (changing the configuration of the furniture) and division (adding boundaries and barriers between people) can create safer spaces. This testing will be able to immediately benefit organizations by providing best practices to assist in retrofitting or reconfiguring existing workplaces. In future phases, the teams will focus on advanced mitigation strategies supported by scientific research and mathematical algorithms to inform better workplace designs. Every pathogen or virus manifests differently. Our initial efforts together will be focused on COVID-19. Within one year, we hope to get to solutions that are applicable to other viruses as well.

### **When do we expect results and how will we share them?**

We expect to publish initial findings later in the summer of 2020. Additional phases are planned for late fall and into 2021. Our findings will be published on Village to allow sales and dealers to share with customers. We also intend to publish stories that can be shared with customers in our 360 research section of steelcase.com

### **How can I learn more about Dr. Bourouiba's work?**

We recommend watching her TEDMED Talk "[How Diseases and Epidemics Move Through a Breath of Air](#)." You can also read and share our 360 article with customers "[Steelcase, MIT Researchers Team Up to Study Pathogens](#)." And you can visit her [website](#).

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