

### ***Expertise and Modeling Ensure Atrium Building and Fire Code Compliance***

**Challenge.** This new 103,000 square-foot office/laboratory research facility at the University of Southern California Molecular & Computational Biology Building located in Los Angeles houses wet and dry laboratory research activities on genome structure and function, as well as programs in molecular biology, computational genomics, chemical biology and interdisciplinary research. The complex four story atrium in the center of the building features bridges that cross over the center that highlight the exterior walls of glass. This intricate design provided fire and life safety design challenges in order to comply with the provisions of the California Building and Fire Codes. The complexity of this laboratory building made Rolf Jensen & Associates (RJA) an excellent candidate to assist the architectural team with the fire/life safety and building codes relating to a biology laboratory, a vivarium and especially an atrium.

**Solution:** As the fire/life safety and building code consultant on the project, RJA conducted Fire Dynamics Simulator (FDS) modeling of the atrium. The three levels of bridges were to provide required egress from the laboratories through the atrium to the exit stairwell. The performance goal of occupant safety was further defined as enabling self evacuation through the atrium during a fire without being burned, overcome by heat or carbon monoxide, or impeded by lack of vision.

By applying the prescriptive code for the smoke control system design, the design requirements were not met in the initial atrium design. The initial modeling showed that proper smoke ventilation was difficult to achieve due to the bridges – smoke would accumulate under the bridges indicating that ventilation was not sufficient. RJA recommended adjustments to the design, while still keeping the architectural bridge design, that enabled code compliance. FDS modeling was again used to demonstrate the effectiveness of the adjusted design.

**Result:** The University of Southern California Molecular & Computational Biology Building was able to meet all the fire/life safety and building code provisions and keep the integrity of the atrium's unique design in the center of the building. RJA's development of a performance based design was vital to the existence of the atrium.

Design for fire safety is the single most significant factor in successful atrium design. By providing a connection to the outside, the glass walls of the atrium bring light into the interior. The atrium's intricate bridge design compliments the connection to natural daylight and provides a more desirable school environment.



- Code Consulting
- Fire Protection Design



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