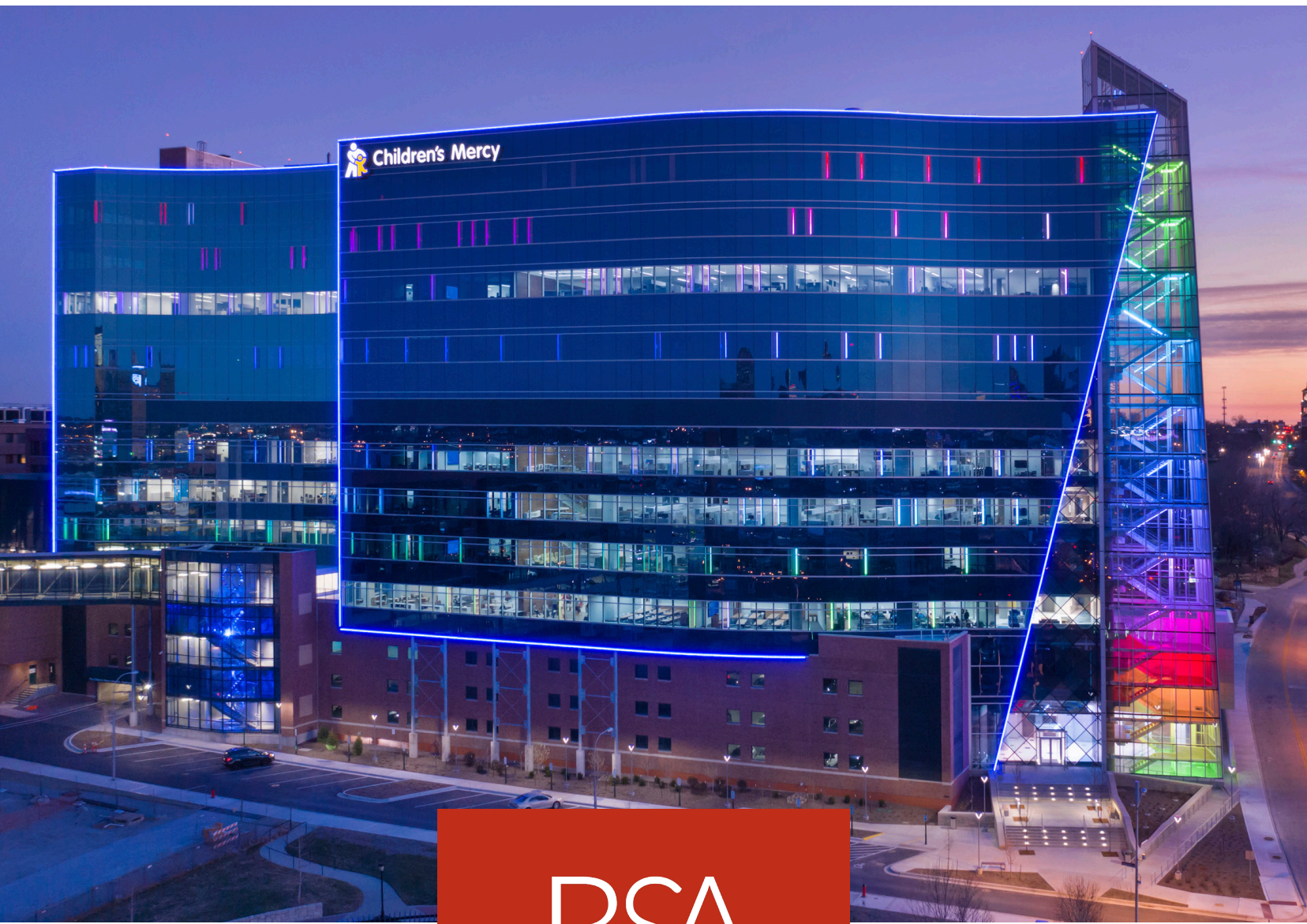
Science-Inspired Design

Integrated Throughout New Pediatric Research Institute

Children's Mercy Research Institute



BSA

Science-Inspired Design Integrated Throughout New Pediatric Research Institute

Science-inspired design of the new Children's Mercy Research Institute (CMRI) visually reflects layers and building blocks of complex discoveries yet to occur while showcasing advancements in pediatric translational medicine that have already been achieved.

The conceptual flow of the nine-story, nearly 400,000-square-foot research building in downtown Kansas City supports the integral nature of cutting-edge, technology-forward research that will soon take place within its walls.

The original intent of the design, from the curvature of the building itself to the imagery woven into its façade, was to visually represent the type of research discoveries occurring inside. The design of the exterior and interior were purposefully envisioned as a sophisticated reminder of the high level of clinical research and exploration, the byproduct of dozens of the brightest minds in pediatric medicine.

Clinicians, scientists, nurses, psychologists, research assistants, study coordinators, sociologists, mathematicians, pharmacogenomists, genomic informaticians and others will begin working in the research facility in early 2021.

The structure's glass curtain wall system – the outer, non-structural covering of the building – has been designed to spur energy efficiency via a strikingly beautiful and research-centric design.

Among them will be Tom Curran, Ph.D., FRS, Senior Vice President, Executive Director and Chief Scientific Officer at CMRI. Curran said the science-inspired imagery that fills the new building – inside and out – intentionally creates a dynamic, synergistic relationship in which trailblazing science echoes art. Much of the design emphasis and the aim to marry art with science, he added, is part of a strategy to support the rich fine arts culture belonging to Kansas City.

“Everywhere in the building, there are science-inspired interpretations that tickle your mind,” said Curran. “These design touches are subtle rather than overt to encourage the beholder to ‘discover’ their meanings.”

Science-inspired imagery is evident even before visitors and scientists enter the building. The contemporary, curved, all-glass façade of CMRI readily identifies the new research institute building from a traditional brick-and-mortar design of the existing hospital and surrounding medical centers. DNA sequences from CMRI pediatric patients are illuminated at night, offering a dramatic view to downtown motorists passing by. Motorists can also appreciate the completely transparent, DNA double-stranded helix-shaped open stairway, also illuminated at night, designed to mimic the movement of a double-stranded DNA helix rotating on its axis.

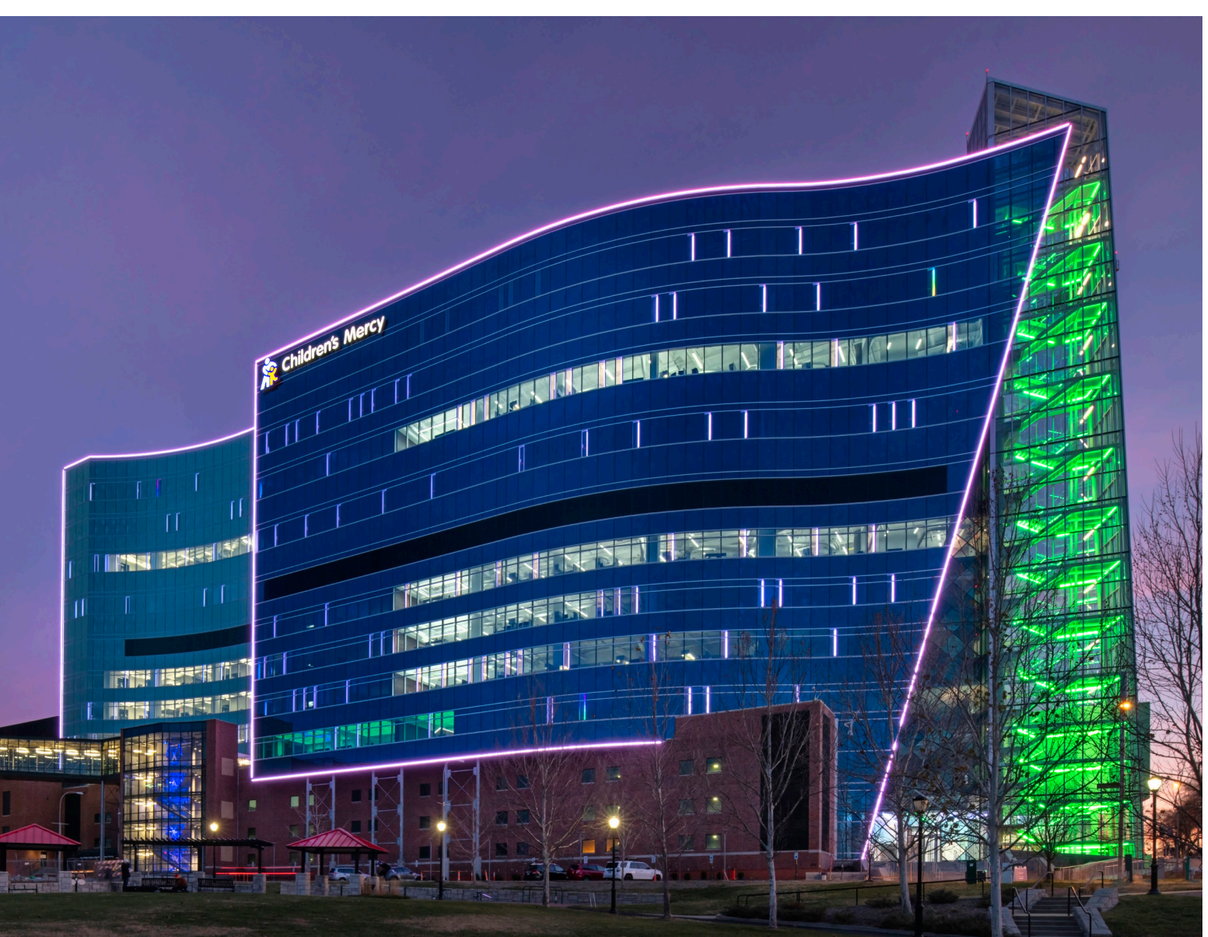
CMRI’s interior spaces also exemplify an abundance of science-inspired design.

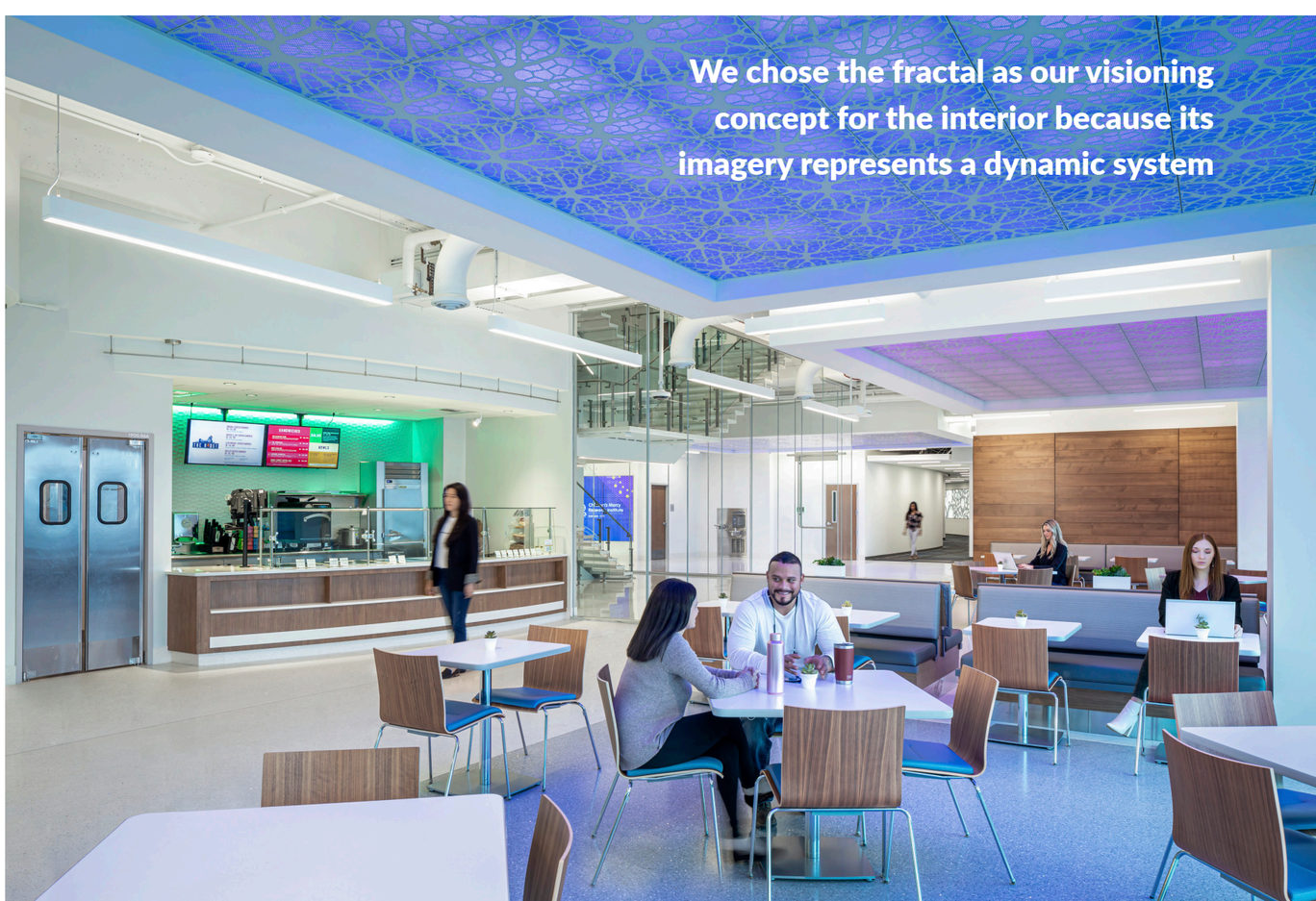
Integrating science-inspired design into the very structure of the building to inspire future research was a key objective throughout the course of the project. Examples include custom-fabricated, “floating” café ceilings with back-lit, custom-perforated metal panels that exhibit an artistic interpretation of overlapping dendrites and biological patterns. These ceilings will be programmed to illuminate colors that match the building’s exterior lighting.

“Walking through the building is like discovering the undiscovered country,” said Kieran Pemberton, Ph.D., Senior Director of Research Development at CMRI. “All of these design touches, paired with white reflective surfaces, support a light, uplifting environment that is reflective of this bright new day in pediatric research.”

Curran agreed. “Everyone within the research realm has to be optimistic,” he said. “Each of us journeys through periods when nothing is working, and we have to go back to the fundamentals. When there is a brief, inspirational flash of discovery, one needs to seize it before it is gone. This is why a bright, reflective, uplifting environment is so important.”

BELOW LEFT | *Without the ability to have clear-vision glass, the structure of the stair would be lost and the connection to the institute’s purpose would not be on display.* BELOW RIGHT | *‘Floating’ cafe ceilings with backlit, custom perforated metal panels that exhibit and artistic impression of overlapping dendrites and biological patterns.*





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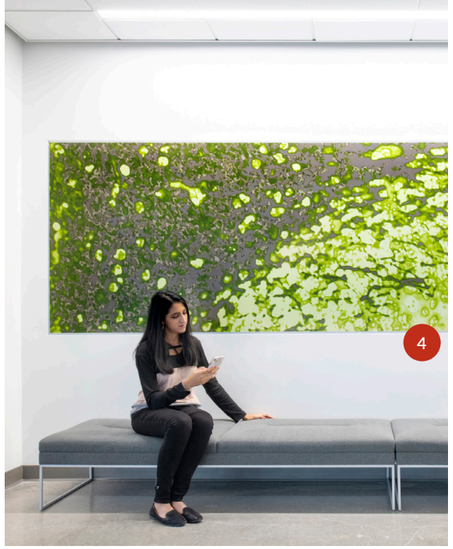

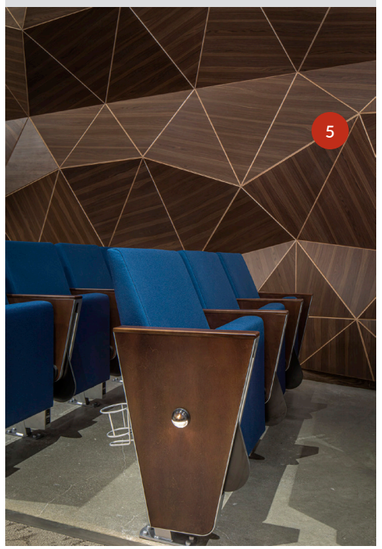

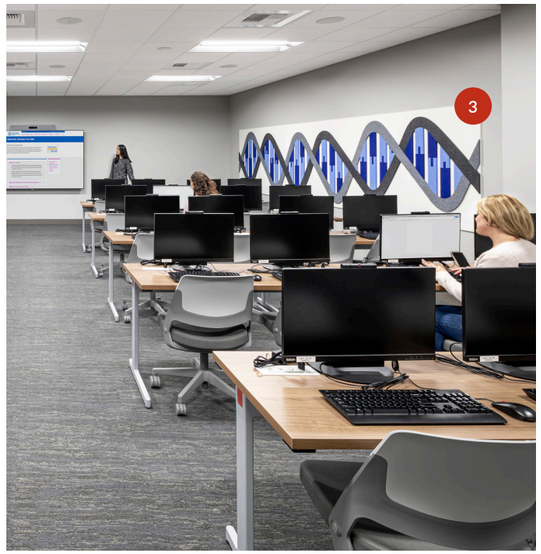

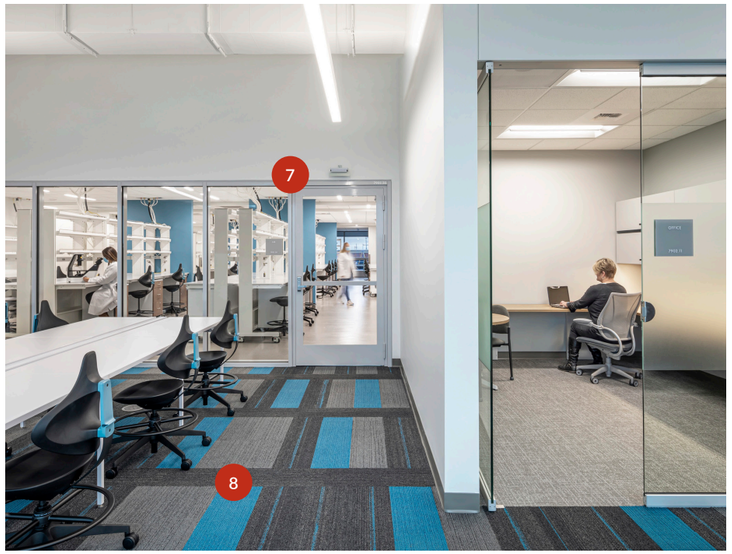

Also exhibiting science-inspired design is the lobby's sparkling terrazzo floor pattern that contains various hues to illustrate the complex interaction with chemical bonds in biological systems. "These patterns are indicative of how people view DNA sequences," Pemberton said, "and of how organisms, tissues and cells are interrelated."

CMRI's interior building design also reflects cutting-edge medical research and discovery. BSA worked closely with CMRI to develop meaningful imagery throughout the building's interior that is derived from actual research and discoveries from CMH scientists.

The team chose the fractal as our visioning concept for the interior because its imagery represents a dynamic system. At its most basic level, a fractal conveys a visual expression of a repeating formula that begins simple yet grows increasingly complex, which closely parallels the process of pediatric medical research.

Yet another example of science-inspired design featuring fractal imagery are the large feature walls connecting the existing Children's Mercy Kansas City facility to each laboratory floor of the new CMRI building. By design, the Children's Mercy physicians' office building is joined to Children's Mercy Hospital with a bridge that leads researchers and clinicians from discovery to treatment, literally and metaphorically, according to Curran. Ground-floor diagrid windows accent this.

1. Terrazzo floor pattern illustrates the complex interaction with chemical bonds in biological systems
2. Back-lit decorative glass panel inspired by hematopoietic (blood-forming) stem cells
3. Acoustic panels inspired by DNA double helix
4. Abstracted image of a tumor caused by gene overactivation
5. 3D wood walls in the auditorium were influenced by the never ending pattern of the fractal
6. Acoustic panels in the wayfinding colors of each floor, emulate DNA sequences
7. Laboratory spaces have natural light on both ends, and the wall colors correlate with the wayfinding on each floor
8. Custom carpet patterns based on DNA sequences
9. The scientific 'Turing' pattern leads researchers and clinicians from discovery to treatment, literally and metaphorically

“Every individual has access to each other, and all scientists are equal to one another, and each is welcome around the table to further that vital synthesis of thought,” said Curran. “Collaboration is essential, as is exploring ideas. The physical bridge between the research institute and hospital is a manifestation of the scientific collaboration that occurs daily.”

A 60-foot-long back-lit decorative glass panel leading occupants from the conference rooms on the first floor through the building and back to the café is one example of thoughtful interior design meant to showcase scientific discovery. The design was inspired by findings and research slides from a study about hematopoietic (blood-forming) stem cells. “Blood-forming stem cells are an essential component of many pediatric cancer therapies,” said Curran. “We asked the BSA design team to incorporate science and discoveries that emerged directly from pediatric research at Children’s Mercy into all the specialty design features throughout this new facility. These science-inspired designs have been integrated into the floors, walls and ceilings with custom finishes and lighting elements,” he added.

Commissioned artwork, each depicting the specific nature of pediatric research occurring on that floor of the building, will adorn the walls of CMRI. Many are being created by Kansas City artists.

The dry labs also exemplify thoughtful design, Curran said, in the vinyl wallcoverings illustrating research specific to a tumor suppressor gene. The walls are stained to highlight this abnormality. Another design image incorporated into the dry labs depicts an abstracted image of a tumor caused by gene overactivation.

With guidance from our team members at Children’s Mercy, our BSA design team created a vision that unified and strengthened the exterior, interior and landscape design in a clear and meaningful way that recognizes the nationally recognized and internationally known research that is occurring at CMRI.

ABOVE | *Throughout the building, investigators are immersed in light that filters through the DNA code designed into the building’s facade. Bright and reflective surfaces create an uplifting environment while intentionally placed pops of color highlight areas for collaboration.* **BELOW** | *All the science-inspired design touches, paired with white reflective surfaces, support a light, inspiring environment reflective of this new chapter in pediatric research.*

FRONT COVER | *The form of both the Children's Mercy Research Institute building and the monumental stair on the west side are inspired by science and by the research that will take place inside.*

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BSA LifeStructures is an integrated design firm creating inspired solutions that improve lives through architecture, engineering, interior design, and planning services. With national expertise and regional leadership, BSA designs LifeStructures – innovative and inviting spaces that not only house the activities of healing, learning, and discovery but actually contribute to them – in order to make a difference for our clients and communities. As such, a LifeStructure is purposeful, a LifeStructure inspires, a LifeStructure delights and a LifeStructure improves lives.

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