When it comes to unlocking the secrets of DNA repair, Ranjit Bindra, MD, PhD, doesn’t think in terms of just resources. The Professor of Therapeutic Radiology and Pathology knows how to look beyond a traditional armamentarium. Based on the Latin word for “armory,” it describes the collection of medicines, equipment, and techniques involved in DNA repair, and Bindra, associate professor of cell biology and of molecular, cellular and developmental biology and co-leader of the radiobiology and radiobiology research program at Yale cancer center, says the team’s expertise in drug development is what makes it possible to secure the gift.

In the two years since, Yale’s work has made significant advances in targeting the BRCA1 and BRCA2 proteins involved with DNA repair that, when mutated, can cause breast, ovarian, prostate, and pancreatic cancers. So, when a $1 million grant became available for BRCA research from the gray foundation in 2018, a team of Yale experts combined their collective skills to secure the gift.

Professor of Therapeutic Radiology and Pathology, Bindra said, “it adds so much more value to the conversation.” However, the work we’ve done has shown us that they have fundamentally different mechanisms. That’s important, it drives the translation of these laboratory targets into patient therapies. His high-throughput testing capabilities enable us to profile all drug candidates to replace current PARP inhibitors. “When we do this testing in an academic setting instead of a pharmaceutical one, we are able to profile all drug candidates and discover potentially new agents,” Dr. Bindra said.

These cell lines have proven invaluable in Yale’s DNA repair research. Faye Rogers, PhD, Associate Professor of Therapeutic Radiology, tapped the library for a cell line in her research on the use of endophytes to develop novel cancer-fighting compounds. Endophytes are fungi or bacteria known as an untapped source for finding novel bioactive natural products.

An undergraduate student in Dr. Rogers’ lab collected endophytes while in Ecuador with Yale’s Rainforest Expedition and Laboratory course. Dr. Rogers identified one that produces a compound that inhibits DNA double-strand break repair in cancers with repair deficiencies. “With new moving forward to come up with a synthetic version of this compound and conducting some medicinal chemistry to improve its efficacy,” she said.

Dr. Rogers has returned the favor to the Brady library. She has advised Dr. Bindra’s students in how to synthesize new classes of DNA repair inhibitors that will further expand their testing capabilities of new compounds. “When working together with different skills and perspectives,” Dr. Bindra said, “it adds so much more value to the conversation.” And adds yet more invaluable tools to Yale’s DNA repair armamentarium.

Using Dr. Bindra’s library of DNA repair inhibitor and damaging agents, he trains them to create new therapeutic combinations to replace current PARP inhibitors. “When we do this testing in an academic setting instead of a pharmaceutical one, we are able to profile all drug candidates and discover potentially new agents,” Dr. Bindra said.

“BRCA2 mutations are a vulnerability that makes it sensitive to ATR inhibitors,” Dr. King explained. She is working to design a clinical trial for ATR inhibitors in BRCA patients with Muller-Grey Foundation were mentor Patrick Lohmann, MD, Professor of Medicine and assistant Cancer Center Director of Experimental Therapeutics.

The team’s expert on BRCA1 is Ryan Jensen, PhD, Assistant Professor of Therapeutic Radiology and Pathology. He was the first scientist to purify and study the proteins involved with DNA repair. When it comes to unlocking the secrets of DNA repair, Ranjit Bindra, MD, PhD, doesn’t think in terms of just resources. The Professor of Therapeutic Radiology and Pathology knows how to look beyond a traditional armamentarium. Based on the Latin word for “armory,” it describes the collection of medicines, equipment, and techniques involved in DNA repair, and Bindra, associate professor of cell biology and of molecular, cellular and developmental biology and co-leader of the radiobiology and radiobiology research program at Yale cancer center, says the team’s expertise in drug development is what makes it possible to secure the gift.

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The team’s expert on BRCA2 is Ryan Jensen, PhD, Associate Professor of Therapeutic Radiology and Pathology. He was the first scientist to purify and study the proteins involved with DNA repair. When it comes to unlocking the secrets of DNA repair, Ranjit Bindra, MD, PhD, doesn’t think in terms of just resources. The Professor of Therapeutic Radiology and Pathology knows how to look beyond a traditional armamentarium. Based on the Latin word for “armory,” it describes the collection of medicines, equipment, and techniques involved in DNA repair, and Bindra, associate professor of cell biology and of molecular, cellular and developmental biology and co-leader of the radiobiology and radiobiology research program at Yale cancer center, says the team’s expertise in drug development is what makes it possible to secure the gift.

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