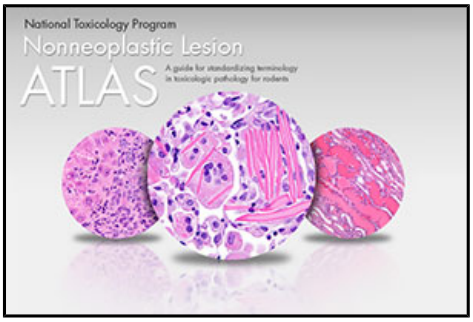
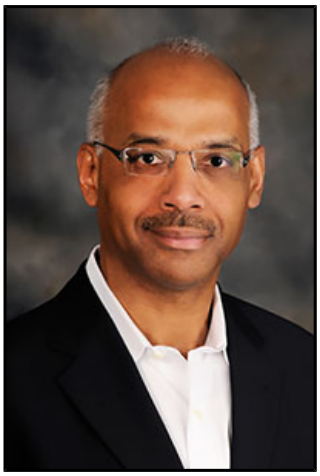
New NTP atlas helps standardize nonneoplastic lesion diagnoses

By Robin Mackar



In January, NTP debuted a new web-based resource that will help pathologists worldwide better diagnose, record, and discuss nonneoplastic rodent lesions. Nonneoplastic lesions, or noncancer lesions, can be precursors to cancer and can also be associated with life-threatening, noncancerous diseases, such as pulmonary fibrosis, and are therefore important findings in toxicity and carcinogenicity studies.

This new tool, the NTP Nonneoplastic Lesion Atlas, *(http://ntp.niehs.nih.gov/nnl)* is available online and is highlighted in a new commentary *(http://tpx.sagepub.com/content/42/2/458.abstract)* by NTP staff in the peer-reviewed journal Toxicologic Pathology.



The NTP Nonneoplastic Lesion Atlas was the brainchild of Sills. It will be used by NTP and its many pathology partners to standardize lesion diagnosis, terminology, and the way lesions are documented. It is expected to improve understanding, consistency, and accuracy between pathologists and laboratories. (Photo courtesy of Steve McCaw)

When completed, the Atlas will consist of thousands of high-quality, zoomable images and diagnostic guidelines arranged in 56 sections organized by organ system, each covering a particular organ or tissue. The subsections on bone marrow in the hematopoietic system; liver and gallbladder in the hepatobiliary system; skin in the integumentary system; brain, nerve, and spinal cord in the nervous system; and the ureter and urinary bladder in the urinary system section are already available.

In addition to the digital images, each lesion page includes the NTP recommended terminology, histopathologic descriptions, and other useful information about the lesions, diagnostic guideline recommendations, and references.

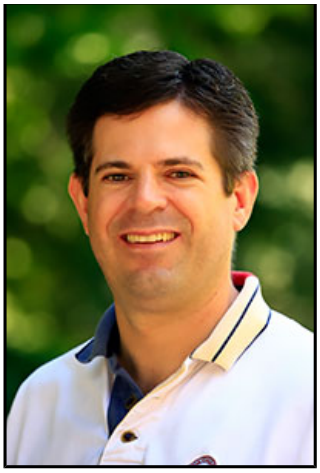
An authoritative resource

"Having a resource that toxicologists and pathologists all over the world can use to speak the same language when diagnosing nonneoplastic lesions in rats and mice will be invaluable to the NTP and to the field," said Robert Sills, D.V.M., Ph.D., head of the NTP Cellular and Molecular Pathology Branch.

Sills conceived the atlas and, along with his team, helped bring the project to fruition. "Being able to actually zoom in and see, in exquisite detail, what these lesions look like and knowing the preferred NTP diagnostic term for each lesion will lead to more standardization of study results," he explained.

The images have been compiled mostly from the NTP archives, a state-of-the art facility that the NTP has been supporting since 1984 to house its expansive collection of research specimens and supporting data from NTP studies.

"The pathology community looks to NTP to develop these kinds of resources," Sills said. The atlas helps improve the organization and diagnostic consistency of the NTP database and can also be used by other laboratories to standardize their diagnostic strategy and improve their own databases.



Cesta has been instrumental in reviewing and coordinating all the content for the new atlas, and has worked with a dedicated team of federal and contract staff to bring the atlas to fruition. When completed, the atlas will contain 56 sections and thousands of images. (Photo courtesy of Steve McCaw)

Establishing the gold standard

"The NTP has long been known for establishing the diagnostic criteria and terminology for neoplastic lesions in rodent cancer bioassays and we wanted to establish the same standards for nonneoplastic lesions," said NTP pathologist Mark Cesta, D.V.M., Ph.D., an editor and author of the Toxicologic Pathology paper and the atlas. Cesta adds that nonneoplastic diseases are also a major cause of morbidity and mortality in humans, with some of these diseases thought to be brought on by environmental causes, making this resource valuable to medical researchers worldwide, as well as to NTP study pathologists.

"We know that many lesions seen in human diseases have relevant counterparts in NTP rodent toxicity and cancer studies," Cesta said. "This will be a living document that we will keep updating as new information about diagnosing nonneoplastic lesions becomes available," Sills said. "It will become the must-have resource for every pathologist and a great training tool for the next generation of toxicologic pathologists."

Collaborative effort

"This was truly a group effort," said NTP Associate Director John Bucher, Ph.D. "We couldn't have accomplished this without drawing upon the expertise of many." Each section of the Atlas was extensively reviewed by NTP pathologists and by independent pathology experts who specialize in specific organ systems.

Additionally, experts in web-based technologies were also called upon to create the online searchable database. The Atlas also went through several focus groups before launching to ensure usability. "I think the Atlas will be a tremendous resource to the NTP and many others," Bucher added.

NTP is proactively creating awareness about the Atlas among key stakeholders. The NTP will host an exhibitor session at the Society of Toxicology annual meeting *(http://www.toxicology.org/AI/MEET/AM2014/index.asp)* in March, offer demonstrations during a NTP satellite symposium at the Society of Toxicologic Pathology annual symposium *(http://www.toxpath.org/AM2014/index.asp)* in June, and provide several demonstrations and webinars for NIEHS and NTP staff, grantees, international users, and pathology students, among others.

Citation: Cesta MF, Malarkey DE, Herbert R, Brix A, Hamlin M, Singletary E, Sills RC, Bucher JR, Birnbaum LS. *(http://tpx.sagepub.com/content/42/2/458.abstract)* 2014. The National Toxicology Program web-based Nonneoplastic Lesion Atlas: A global toxicology and pathology resource. Tox Path 42:458-460.

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