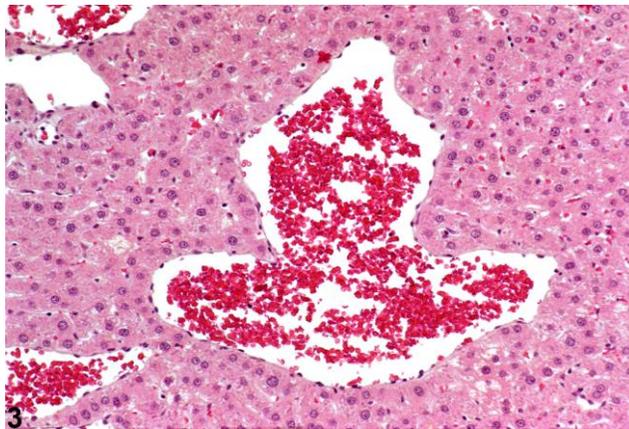
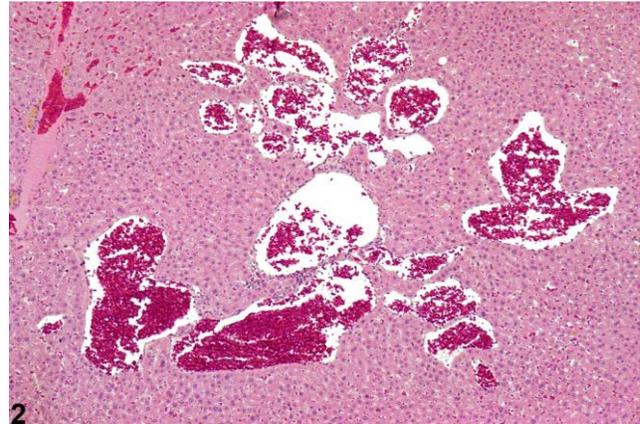
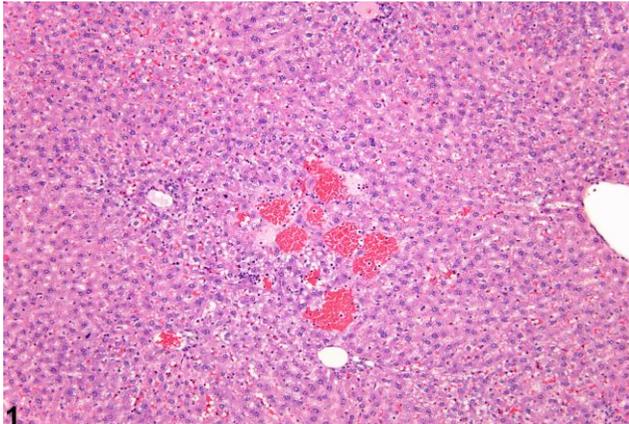




# NTP Nonneoplastic Lesion Atlas

## Liver – Angiectasis



**Figure Legend:** **Figure 1** Angiectasis in a female F344/N rat from a chronic study. **Figure 2** Angiectasis in a female F344/N rat from a chronic diet restriction study. **Figure 3** Angiectasis in a female F344/N rat from a chronic diet restriction study (higher magnification of Figure 2).

**Comment:** Focal and multifocal angiectasis (Figure 1 and Figure 2) occurs spontaneously, and more frequently as animals age, but it can also be caused by chemicals such as nitrosamines. It consists of dilated sinusoidal spaces that are lined by normal-appearing endothelial cells (Figure 3). In larger dilated spaces, endothelial cells may multiply to line the dilated spaces. Hepatocytes adjacent to angiectatic spaces may be normal or slightly atrophic. Angiectasis is distinguished from cystic degeneration by the presence of erythrocytes in endothelial-lined



# NTP Nonneoplastic Lesion Atlas

## Liver – Angiectasis

channels. The distinction between marked cases of angiectasis and hemangioma is often unclear.

**Recommendation:** Angiectasis should be documented and graded whenever present as an independent event but should not be diagnosed if it is associated with another lesion, such as a focus or a neoplasm. The number of dilated spaces and their degree of dilation will influence grading. Any indication of treatment-induced angiectasis should be recorded, graded, and described in the pathology narrative.

### References:

Eustis SL, Boorman GA, Harada T, Popp JA. 1990. Liver. In: Pathology of the Fischer Rat (Boorman GA, Eustis SL, Elwell MR, Montgomery CA, MacKenzie WF, eds). Academic Press, San Diego, 71–94.

Abstract: <http://www.ncbi.nlm.nih.gov/nlmcatalog/9002563>

Evans JG, Lake BG. 1998. The digestive system II. Hepatobiliary system. In: Target Organ Pathology (Turton J, Hooson J, eds). Taylor and Francis, London, 61–98.

Abstract: <http://www.amazon.com/Target-Organ-Pathology-Basic-Text/dp/0748401571>

Greaves P. 2007. Histopathology of Preclinical Toxicity Studies: Interpretation and Relevance in Drug Safety Evaluation, 3rd ed. Elsevier, Amsterdam.

Abstract: <http://www.sciencedirect.com/science/book/9780444527714>

Harada T, Enomoto A, Boorman GA, Maronpot RR. 1999. Liver and gallbladder. In: Pathology of the Mouse: Reference and Atlas (Maronpot RR, Boorman GA, Gaul BW, eds). Cache River Press, Vienna, IL, 119–183.

Abstract: <http://www.cacheriverpress.com/books/pathmouse.htm>

Hardisty JF, Brix AE. 2005. Comparative hepatic toxicity: Prechronic/chronic liver toxicity in rodents. Toxicol Pathol 33:35–40.

Full-Text: <http://txp.sagepub.com/content/33/1/35.full.pdf>

Haschek WM, Rousseaux CG, Wallig MA. 2010. Fundamentals of Toxicologic Pathology, 2nd ed. Academic Press, San Diego, 197–235.

Abstract: <http://www.sciencedirect.com/science/book/9780123704696>



# NTP Nonneoplastic Lesion Atlas

## *Liver – Angiectasis*

### References:

National Toxicology Program. 2010. NTP TR-557. Toxicology and Carcinogenesis Studies of  $\beta$ -Myrcene (CAS No. 123-35-3) in F344/N Rats and B6C3F1 Mice (Gavage Studies). NTP, Research Triangle Park, NC.

Full-Text: [http://ntp.niehs.nih.gov/ntp/htdocs/LT\\_rpts/TR557.pdf](http://ntp.niehs.nih.gov/ntp/htdocs/LT_rpts/TR557.pdf)

Thoolen B, Maronpot RR, Harada T, Nyska A, Rousseaux C, Nolte T, Malarkey D, Kaufmann W, Kutter K, Deschl U, Nakae D, Gregson R, Winlove M, Brix A, Singl B, Belpoggi F, Ward JM. 2010. Hepatobiliary lesion nomenclature and diagnostic criteria for lesions in rats and mice (INHAND). *Toxicol Pathol* 38:5S–81S.

Full-Text: [http://tpx.sagepub.com/content/38/7\\_suppl/5S.full](http://tpx.sagepub.com/content/38/7_suppl/5S.full)

### Author:

Robert R. Maronpot, DVM, MS, MPH, DACVP, DABT, FIATP  
Senior Pathologist  
Experimental Pathology Laboratories, Inc.  
Research Triangle Park, NC