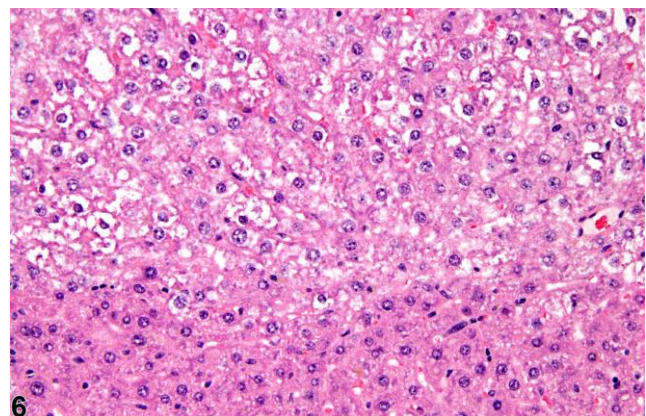
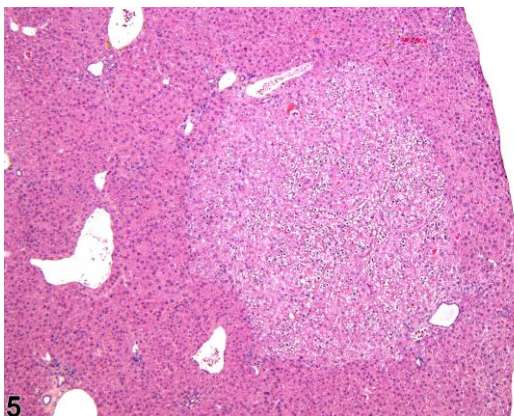
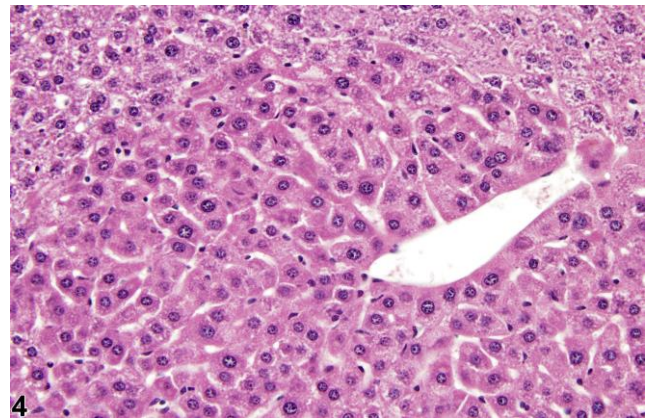
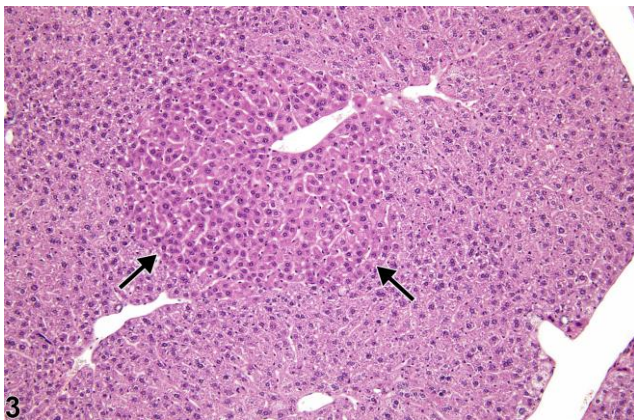
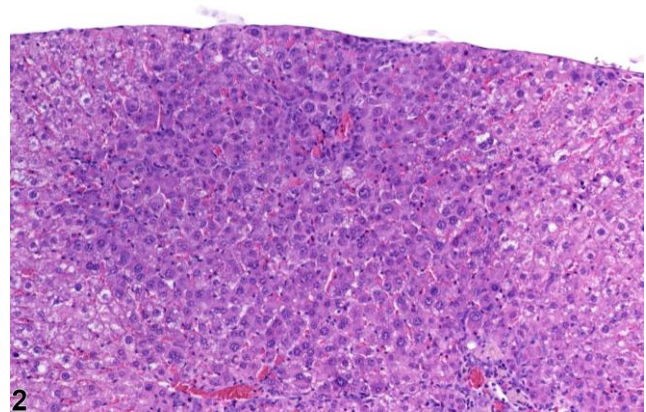
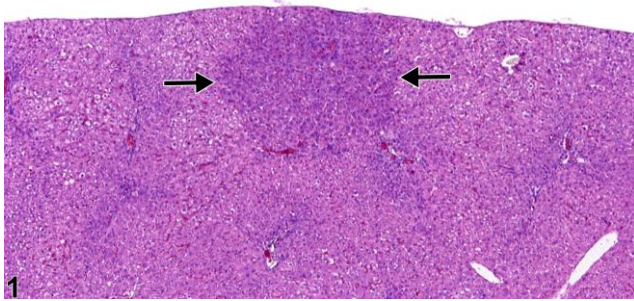




NTP Nonneoplastic Lesion Atlas

Liver – [Basophilic, Eosinophilic, Clear cell, Mixed] Focus





NTP Nonneoplastic Lesion Atlas

Liver – [Basophilic, Eosinophilic, Clear cell, Mixed] Focus

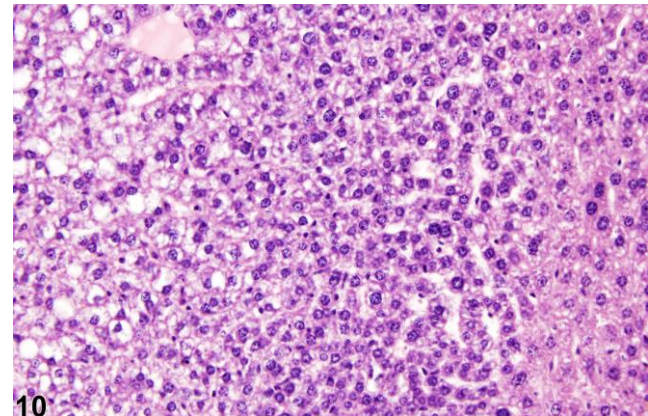
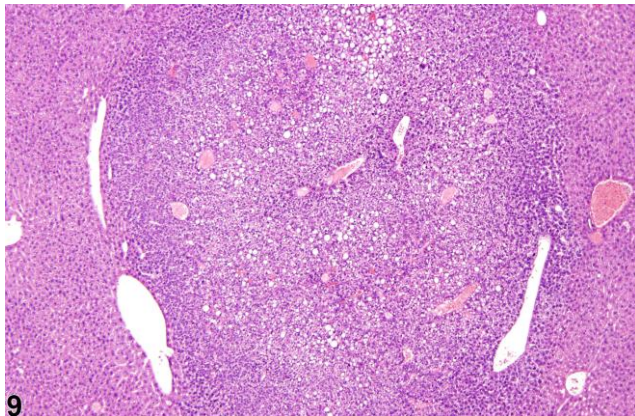
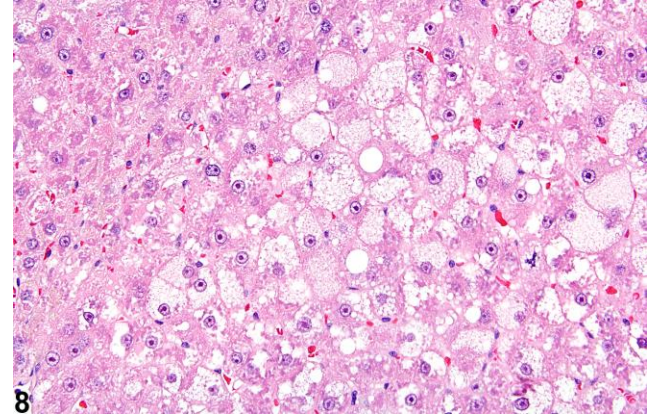
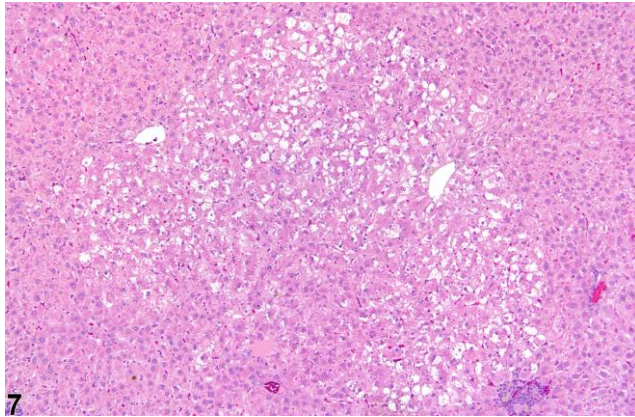
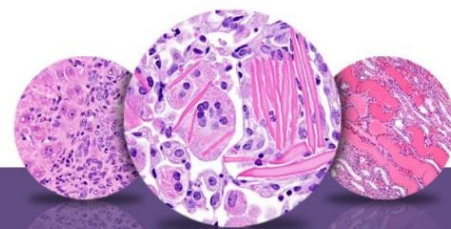


Figure Legend: **Figure 1** Basophilic focus (arrows) in a male F344/N rat from a subchronic study. **Figure 2** Basophilic focus in a male F344/N rat from a subchronic study (higher magnification of Figure 1). **Figure 3** Eosinophilic focus (arrows) in a male B6C3F1 mouse from a chronic study. **Figure 4** Eosinophilic focus in a male B6C3F1 mouse from a chronic study (higher magnification of Figure 3). **Figure 5** Clear cell focus in a female B6C3F1 mouse from a chronic study. **Figure 6** Clear cell focus in a female B6C3F1 mouse from a chronic study (higher magnification of Figure 5). **Figure 7** Mixed cell focus in a female Harlan Sprague-Dawley rat from a chronic study. **Figure 8** Mixed cell focus in a female Harlan Sprague-Dawley rat from a chronic study (higher magnification of Figure 7). **Figure 9** Mixed cell focus in a male B6C3F1 mouse from a chronic study. **Figure 10** Mixed cell focus in a male B6C3F1 mouse from a chronic study (higher magnification of Figure 9).



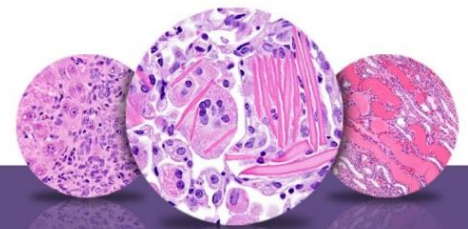
NTP Nonneoplastic Lesion Atlas

Liver – [Basophilic, Eosinophilic, Clear cell, Mixed] Focus

Comment: Foci of cellular alteration, diagnosed simply as “foci” in NTP studies, can occur spontaneously in rats and mice but may also be induced by treatment. They range from less than a lobule to several lobules in size. Foci are presumptive preneoplastic lesions that can vary from barely perceptible to cytomorphologically and tinctorially discrete lesions. Foci typically blend imperceptibly with, and do not compress, surrounding hepatic parenchyma, though minimal compression may occur. Foci are relatively common in chronic studies but uncommon in subchronic studies. They are subclassified based on hematoxylin and eosin tinctorial properties and cytoplasmic features.

Basophilic foci predominantly stain with hematoxylin (Figure 1, arrows; Figure 2). A tigroid variant has been identified in rats but is considered a subclassification of basophilic focus. *Eosinophilic foci* typically stain more eosinophilic than surrounding hepatocytes and often consist of hepatocytes that are larger than the adjacent normal parenchyma (Figure 3, arrows; Figure 4). *Clear cell foci* have empty spaces in hepatocyte cytoplasm surrounding centrally localized nuclei. The clear spaces represent glycogen dissolved out during fixation and processing. Clear cell foci are readily identified because they stand out against surrounding parenchyma that has a more uniformly eosinophilic cytoplasm (Figure 5 and Figure 6). Some texts discuss vacuolated cell foci, but these are now diagnosed as focal fatty change and are not considered foci. *Mixed cell focus* is diagnosed when there is no single predominant phenotype. Figure 7 and Figure 8 represent a mixed cell focus composed of clear cells, vacuolated cells, and amphophilic cells with no single cell type constituting more than 80% of the focus cells. Figure 9 and Figure 10 present a mixed focus composed of an outer rim of basophilic cells surrounding an inner core of clear cells, each comprising an equal proportion of the cell types present.

Recommendation: Because foci are presumptive preneoplastic lesions, they should be diagnosed whenever present. The current NTP recommendation is to document all foci and to classify these into subtypes (basophilic, eosinophilic, clear cell, or mixed). A severity grade is not required for foci unless the pathologist feels it is necessary to highlight differences among the study groups.



NTP Nonneoplastic Lesion Atlas

Liver – [Basophilic, Eosinophilic, Clear cell, Mixed] Focus

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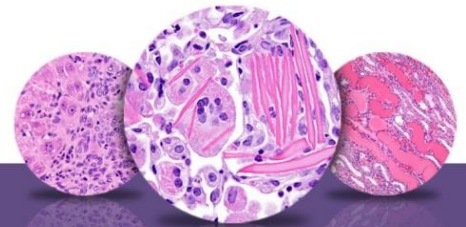
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Liver – [Basophilic, Eosinophilic, Clear cell, Mixed] Focus

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