

- daclatasvir (42),
- dasabuvir (43),
- ombitasvir (44,45),
- ABT-333 (46),
- asunaprevir (47),
- ritonavir (48,49).

All of the cited clinical trials used the indicated drug in combination with one or more anti-HCV drugs, where this other drug typically included ribavirin. FDA's Guidance for Industry provides a background for conducting clinical trials on HCV (50).

In the scientific literature, various spellings are used for interferon-alpha, including "interferon-alpha," "alpha-interferon," "interferon-alfa," and names that use the Greek letter alpha. This textbook uses the name that best corresponds to that from the published study being described.

V. IMMUNE RESPONSES AGAINST HCV

Immune response, in particular, response by cytotoxic T cells ($CD8^+$ T cells), plays a major role in combating HCV infections. $CD8^+$ T cells destroy HCV by killing liver cells that contain the virus. $CD8^+$ T cells use a second, independent mechanism for combating HCV, namely, expression of IFN-gamma. IFN-gamma released by $CD8^+$ T cells has a direct, negative effect on the virus, that is, it inhibits viral replication (51). IFN-gamma is also called "gamma-interferon."

HCV-specific $CD8^+$ T cells can be detected by way of biopsies of the liver, and more conveniently, in blood samples (52). Hence, the immune system's response against HCV infections can be easily be determined by acquiring blood samples, and by characterizing the

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⁴³Ferenci P, Bernstein D, Lalezari J, et al. ABT-450/r-ombitasvir and dasabuvir with or without ribavirin for HCV. *New Engl. J. Med.* 2014;370:1983–92.

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⁴⁶Kowdley KV, Lawitz E, Poordad F, et al. Phase 2b trial of interferon-free therapy for hepatitis C virus genotype 1. *New Engl. J. Med.* 2014;370:222–32.

⁴⁷Lok AS, Gardiner, DF, Lawitz E, et al. Preliminary study of two antiviral agents for hepatitis C genotype 1. *New Engl. J. Med.* 2012;366:216–24.

⁴⁸Kowdley KV, Lawitz E, Poordad F, et al. Phase 2b trial of interferon-free therapy for hepatitis C virus genotype 1. *New Engl. J. Med.* 2014;370:222–32.

⁴⁹Ferenci P, Bernstein D, Lalezari J, et al. ABT-450/r-ombitasvir and dasabuvir with or without ribavirin for HCV. *New Engl. J. Med.* 2014;370:1983–92.

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