New nonlinear methods of fluorescencel analysis of peripheral blood neutrophils have been developed. We used a sensitive technology of respiratory burst reaction of DNA fluorescence in the cells nuclei due to oxidative activity. Histograms in flow cytometry experiments are considered. Fluorescence flashes frequency as functions of fluorescence intensity are analyzed. Information entropies for standard deviation of immunofluorescence distributions and Hurst exponents are analyzed for histogram's ranges. Statistic peculiarities of histograms set for healthy and unhealthy donors allow dividing all histograms on the three classes for healthy donors and donors with oncology/autoimmune and inflammatory diseases. Alterations of immunofluorescence-net statistics and fractal dimensions in diagnostics of different diseases in various medical treatments have been demonstrated and discussed.