Scientific study on the positive effect on human beings exposed to negative ions

I was asked by Mr Baldinger to write a résumé about the role of airborne negative ions in health and disease. In this letter I present my own personal conviction, based on recent literature.

Negatively charged ions are bactericidal and reduce free floating dust in closed rooms. There are several papers to this topic. The transmission of mycobacteria as an example for an airborne bacterial infection was reduced by 86% when negative ionisation of the air was induced and guinea pigs were constantly exposed to this air in comparison to the guinea pigs that were not. (Exombe AR et al. PLoS Med. 2009; 17,6)

Seo et al state that negative ionization of the air has a significant impact on airborne microbial load and that most of this effect is through direct killing of the organisms as well as reducing the load of airborne dust. The principle has already been successfully applied to poultry hatching cabinets, where high dust loads and bacterial transfections are a major problem. Infections were significantly reduced in these cases. (Seo et al J. Food prot. 2011;64 113-116)

The main source of chronic inflammatory activity in the lung in humans are urban air inhalable particles that often contain microorganisms as well. These can be responsible for premature mortality, increased hospital admissions and asthma in the population. The finer the particles in the air, the deeper they penetrate into the lungs and finally reach the alveoli. Thus, inflammatory injury and oxidative damage caused by these fine particles is stronger if the particles are very small. Negatively charged ions are capable of diminishing these floating particles in the air (Helsinki_Study: Happo MS et al. inhal. Toxicol. 2010: 17-32). Athens Study: Valavanidis A. et al, J Environ. Sci. Health C Environ Carcinog. Ecotoxicol Rev 2008; 338-362)

In addition negative airborne ions positively influenced the vegetative nervous system. Exposure to air loaded with these ions, reduced blood pressure and heart rate in humans significantly. (Suzuki S. et.al. Int.J. Biometerol. 2008; 52:481-489). This is why negatively charged ions make people feel more relaxed.

It is difficult to be precise about the concentration of ions that would cause damaging effects. Exposure to very high concentrations of negatively charged ions in the air (320´000 – 350´000 ions per cm3 had no damaging affect on the lung, when inhaled during a short time (60 minutes). Sirota, TV: Biofizika 2008: 886-893).

No study is available to my knowledge that explores longer exposures to such high ion concentrations in the air.