Radiation driven chemistry in biomolecules – is (V)UV involved in the bioactivity of argon jet plasmas?

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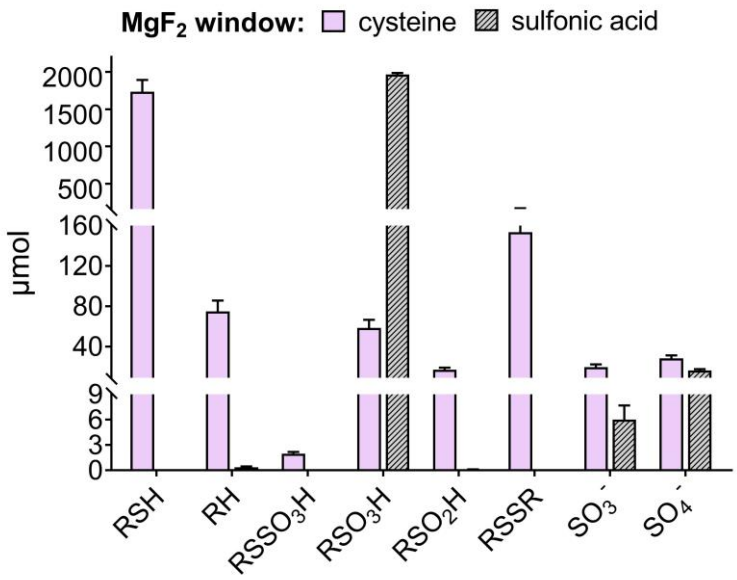
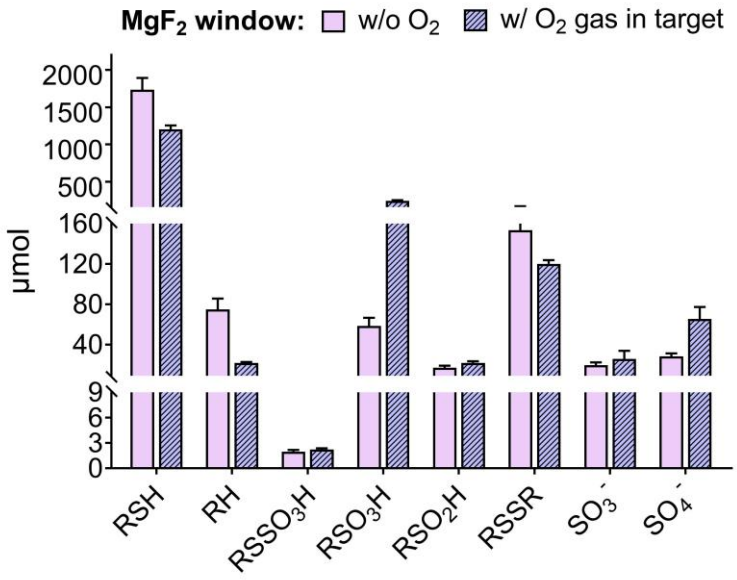


SI figure 1: To compare the impact of argon plasma jet (kINPen) derived (V)UV on oxidation products of cysteine, cysteine sulfonic acid was treated in an identical fashion (MgF2 window, micro-irradiation chamber, see figure 1 of main article). A cleavage of the C-S bond by the argon excimer radiation was observed. Due to the low amounts of sulfite and sulfate ions formed it can be concluded that the majority of C-S bond cleavages occurs at the cysteine or cystine level and the formed SH radicals/H_2S are further oxidized to yield sulfate and sulfite.



SI figure 2: a deaerated solution of cysteine (standard protocol) and a solution of cysteine saturated with oxygen by 30 min of bubbling were compared. Changes in the product pattern were observed, indicative for a role of dissolved oxygen as a reaction partner (ozone formation) or educt (atomic O formation via VUV photon driven bond cleavage). Further experiments using isotopes would be necessary to identify the contribution of each reaction.