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Autore	Christine Gaboriaud
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Sommario/riassunto

C1q is the target recognition protein of the classical complement pathway and a major connecting link between innate and acquired immunity. As a charge pattern recognition molecule of innate immunity, C1q can engage a broad range of ligands derived from self, non-self and altered self via its heterotrimeric globular (gC1q) domain and thus trigger the classical complement pathway. The trimeric gC1q signature domain has been identified in a variety of non-complement proteins that can be grouped together as a C1q family. C1q circulates in serum as part of the C1 complex, in association with a catalytic tetrameric assembly of two homologous yet distinct serine proteases, C1r and C1s. Binding of C1q to appropriate targets leads to sequential activation of C1r and C1s, the latter being able to cleave complement components C4 and C2 thereby triggering the complement cascade. Activation of the classical pathway plays an important role in innate immune protection against pathogens and damaged elements from self. However, its involvement has been shown in various pathologies including ischemia-reperfusion injury and hereditary angioedema. Unexpected roles for the classical pathway have also been discovered recently, linked to both physiological and pathological aspects of development, including brain and cancer cells. These new perspectives should arouse renewed interest in a search for specific inhibitors of the classical pathway. In addition, C1q has recently been shown to have a number of functions that are independent of the activation of the

classical pathway. This research topic is aimed at providing a state-of-the-art overview of the classical pathway, including, but not restricted to emerging functions of C1q and of the C1 complex, as well as pathological consequences of C1 activation or of the presence of anti-C1q autoantibodies . Contributions are included in the areas such as structural basis of C1q ligand recognition, C1q family proteins, inhibitors of the classical pathway identified in pathogens and improved derived inhibitors, structural determinants of the substrate specificities of C1r and C1s, elucidation of the architecture of C1, structural and functional homology of C1 with the initiating complexes of the lectin complement pathway, and novel involvement of C1q in processes such as ageing, cancer, synaptic pruning, and pregnancy.