



CHEMICAL-BIOLOGICAL PROFILING OF TI(IV) METAL-ORGANIC COMPOUNDS WITH CHRYSIN IN HUMAN (PATHO)PHYSIOLOGIES

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Abstract: Research activity was focused on the development of Ti(IV) metal ionic complexes that resist hydrolysis or afford hydrolysis products that can be defined physicochemically, thus linking the actual species with the biological function, starting with titanium dioxide. The challenge in this specific research has been the employment of the flavonoid chrysin as natural product with distinct antioxidant, anti-inflammatory, and anti-cancer properties.

• Introduction

Over the past seven decades, transition metal-based complexes have been used as treatment agents in the administration and therapy of different forms of cancer. Severe side-effects, however, associated with the administration of the employed metallodrugs, have since long burdened (limited) the use of specific metallocomplexes exhibiting therapeutic potential [1]. To that end, there is an urgent need for developing alternative drugs that are atoxic, soluble and bioavailable, and target specific. The idea rests on their ability to exhibit fewer side-effects and higher selectivity and specificity in antitumor or antidiabetic activity [2]. Hence the effort to pursue and achieve hybrid binary Ti(IV)-flavonoid systems capable of exerting beneficial biological activity in health and disease.

• Material and methods

All experiments were carried out under aerobic conditions. TiCl_4 was handled in a fume hood, using inert atmosphere.

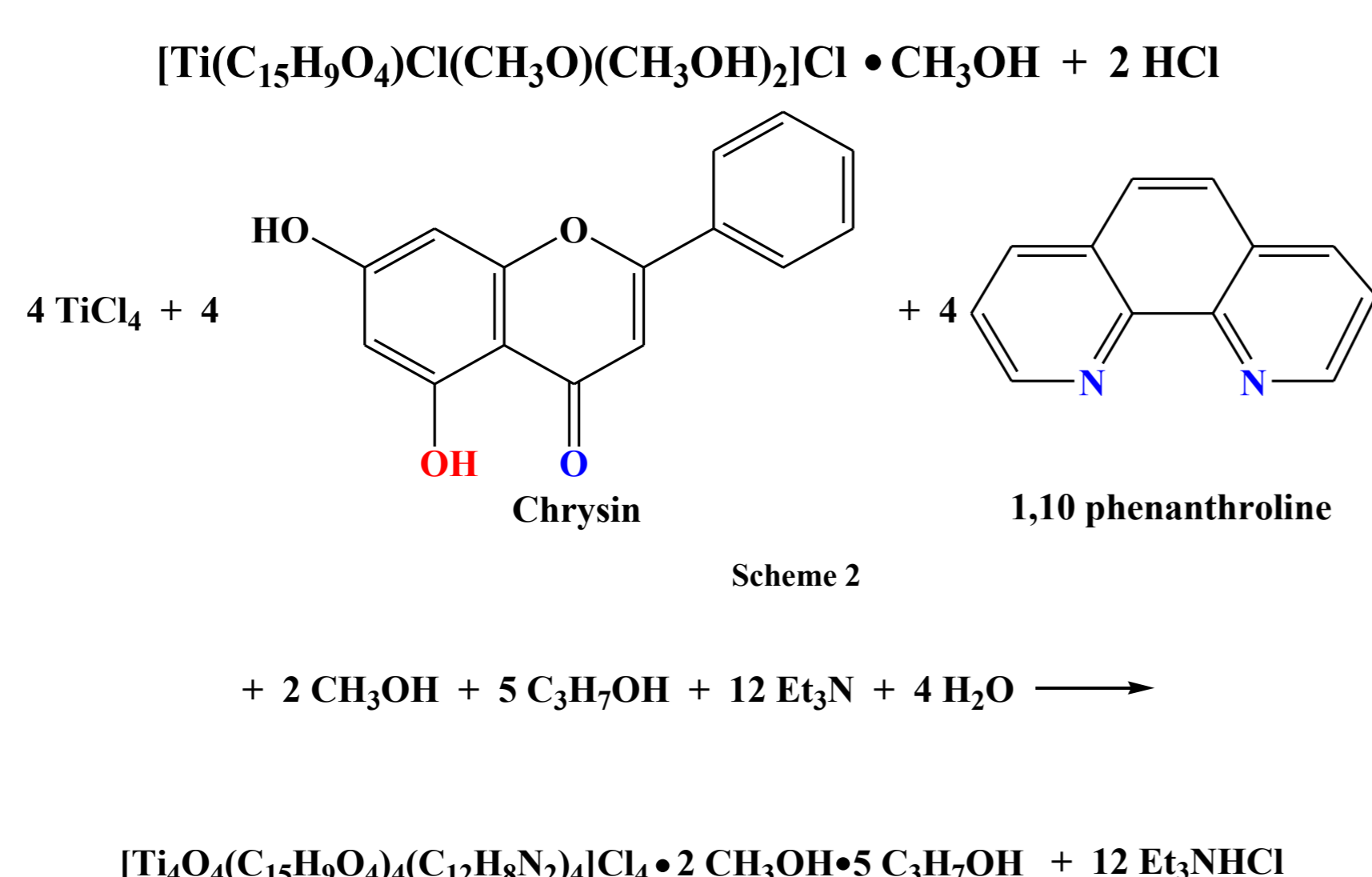
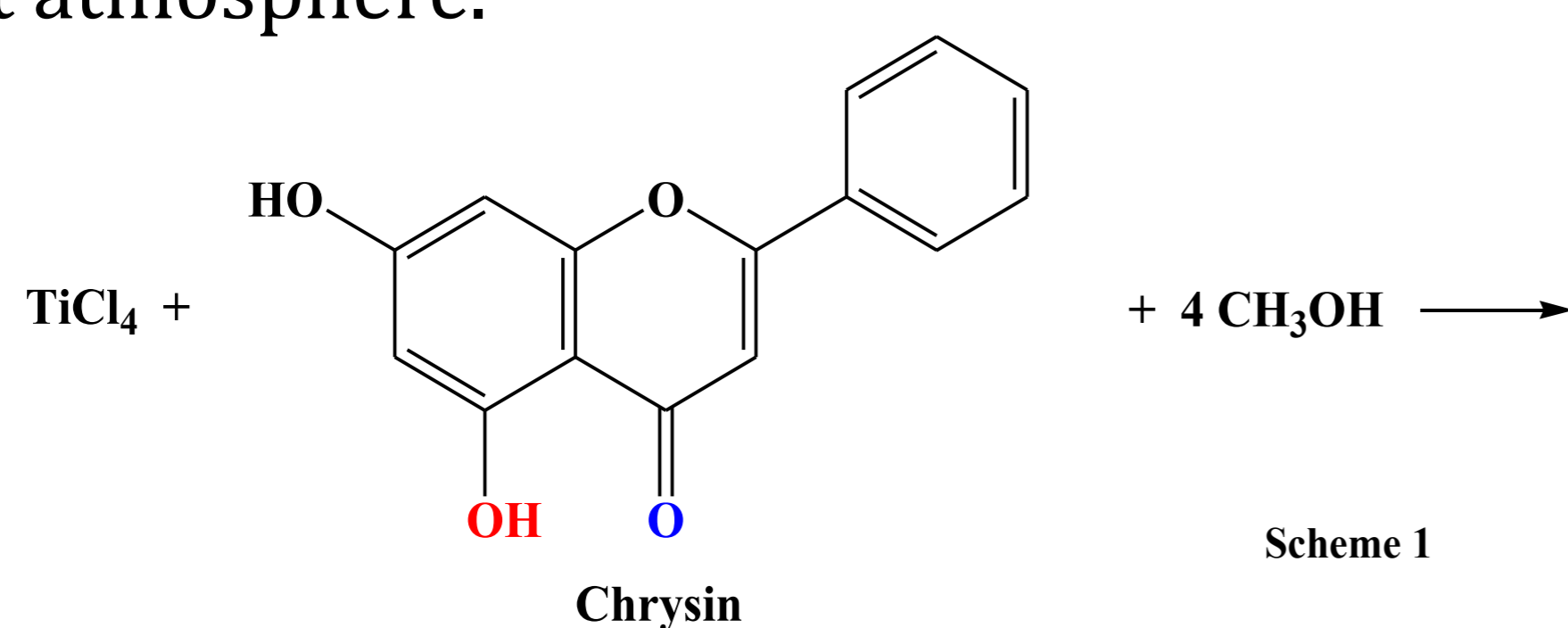


Fig. 1: Reactions of Ti(IV) with flavonoid chrysin

• Results and Discussion

Binary and ternary materials synthesized in this work were fully-characterized in solution and in the solid state. Further studies ensued on their anti-inflammatory properties, as shown in (Fig. 2).

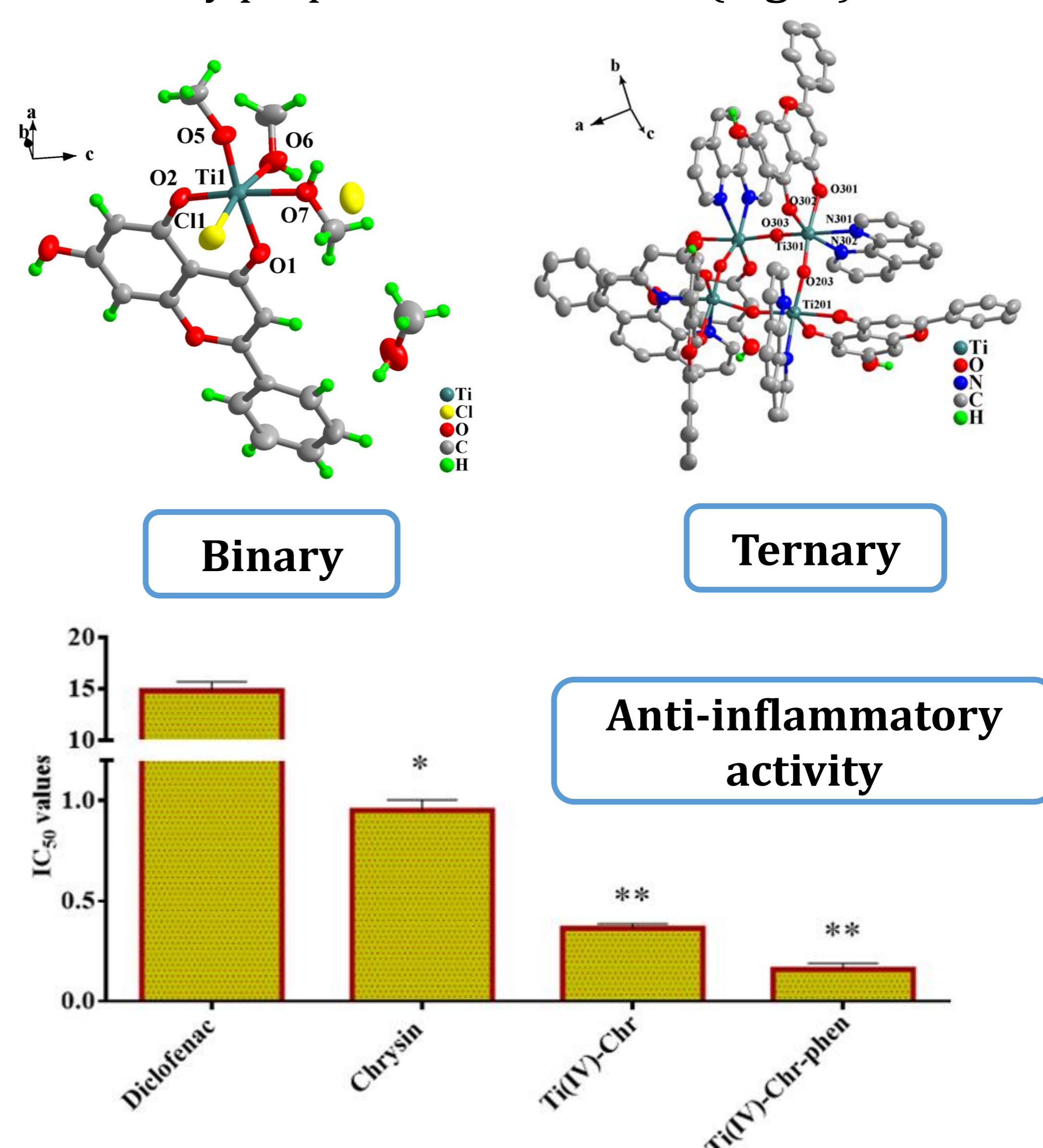


Fig. 2: Characterization of Ti(IV) metal organic compounds and their anti-inflammatory properties

• Conclusions

The collective experimental results formulate a distinct biological profile with enhanced anti-inflammatory properties compared to Diclofenac, thus setting the basis for their potential use in future therapeutics.

References:

- [1]. Meléndez E. Critical Reviews in Oncology-Hematology 42(3) (2002) 309-315.
- [2]. Tshuva E.Y., Miller M. Metal Ions in Life Sciences 18 (2018) 219-250.