

Molecular Recognition of Non-Photoreactive Peptides and Amino acids using Photoreactive Calixarene containing 6-Methoxy Quinoline as Detectable Moiety



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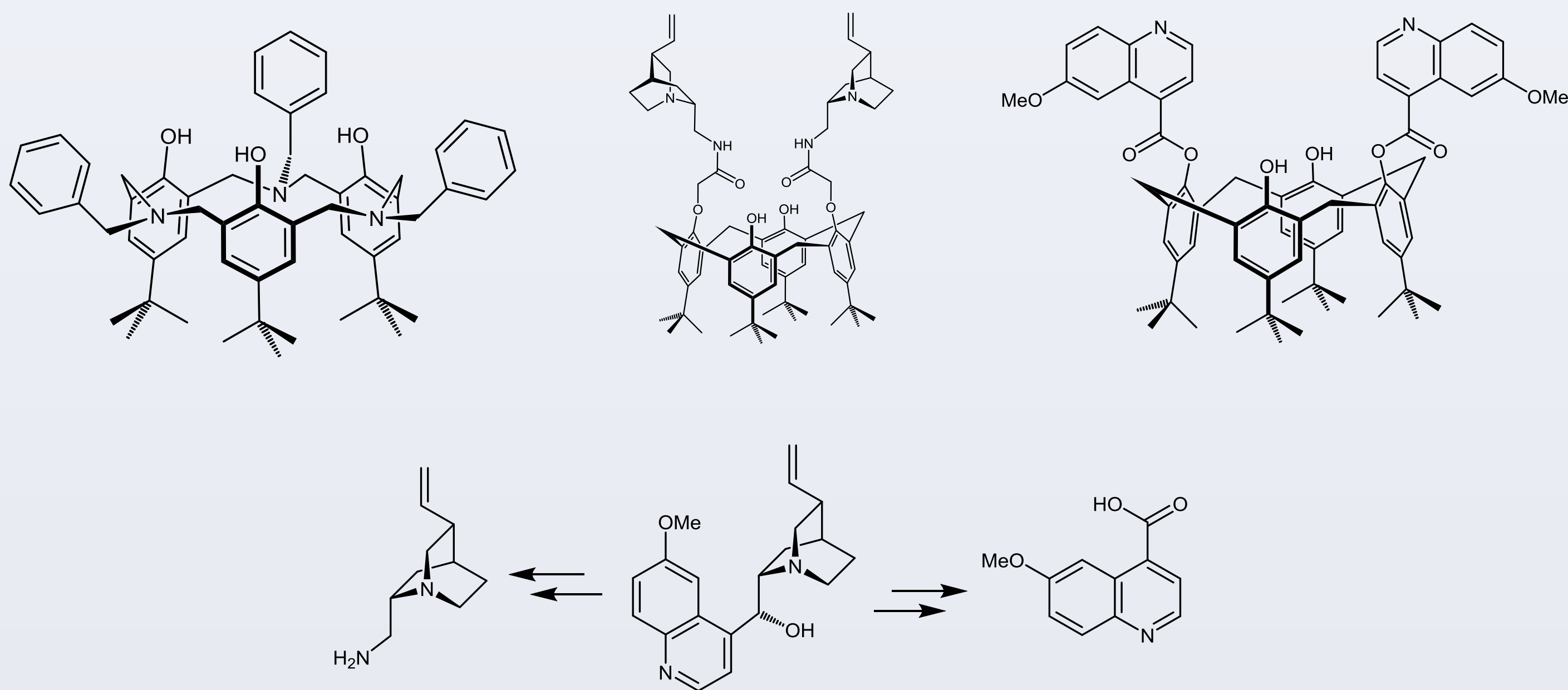


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INTRODUCTION

A series of modified calix[4]arenes and Homoaza-calix[3] arene have been synthesized which should be used in molecular recognition [1]. The nature of the modifications were in two directions. On one hand we introduced fluorescent groups [2] and on the other we coupled asymmetric moieties, which based on the chiral natural-product-based compounds QCI and QCD [3, 4]. This modification and the ring size affected the cavity for molecular recognition of the Calixarens.

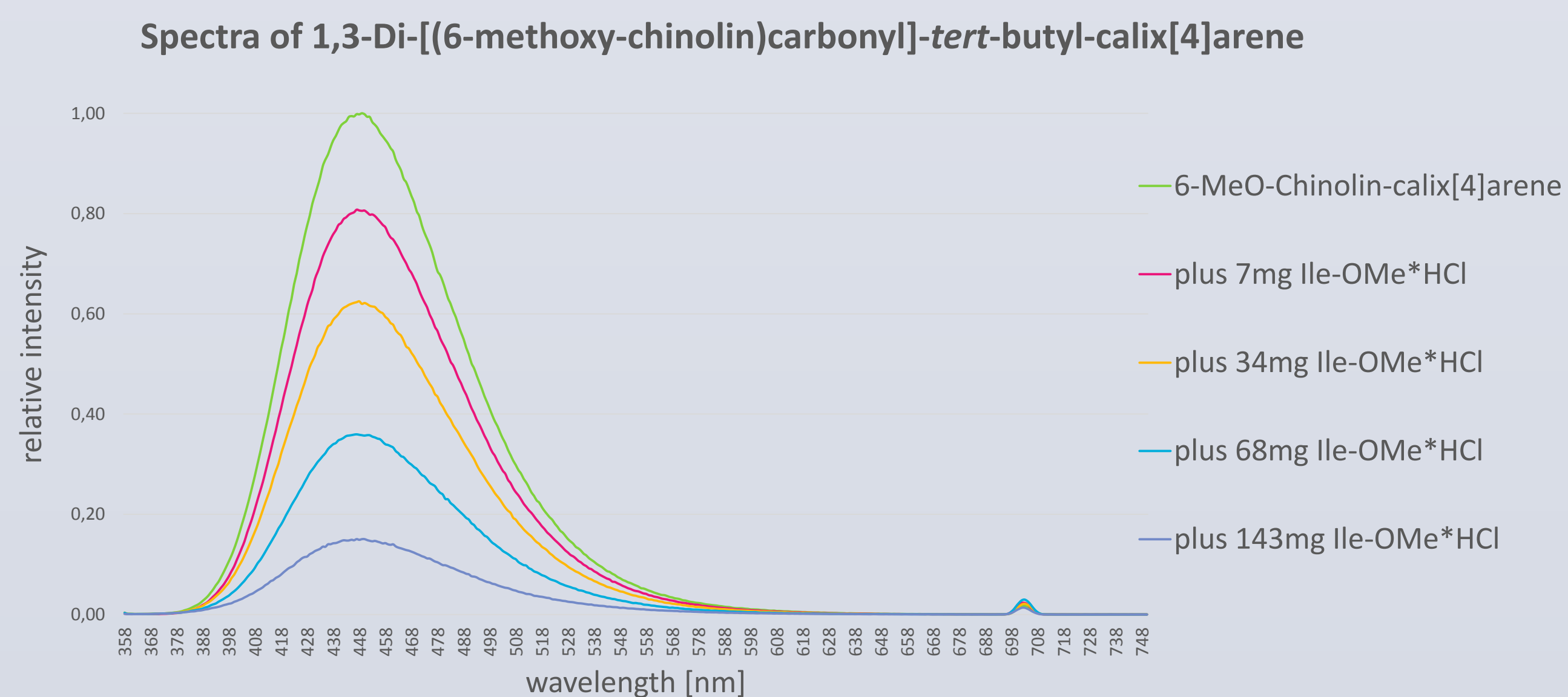


OBJECTIVES

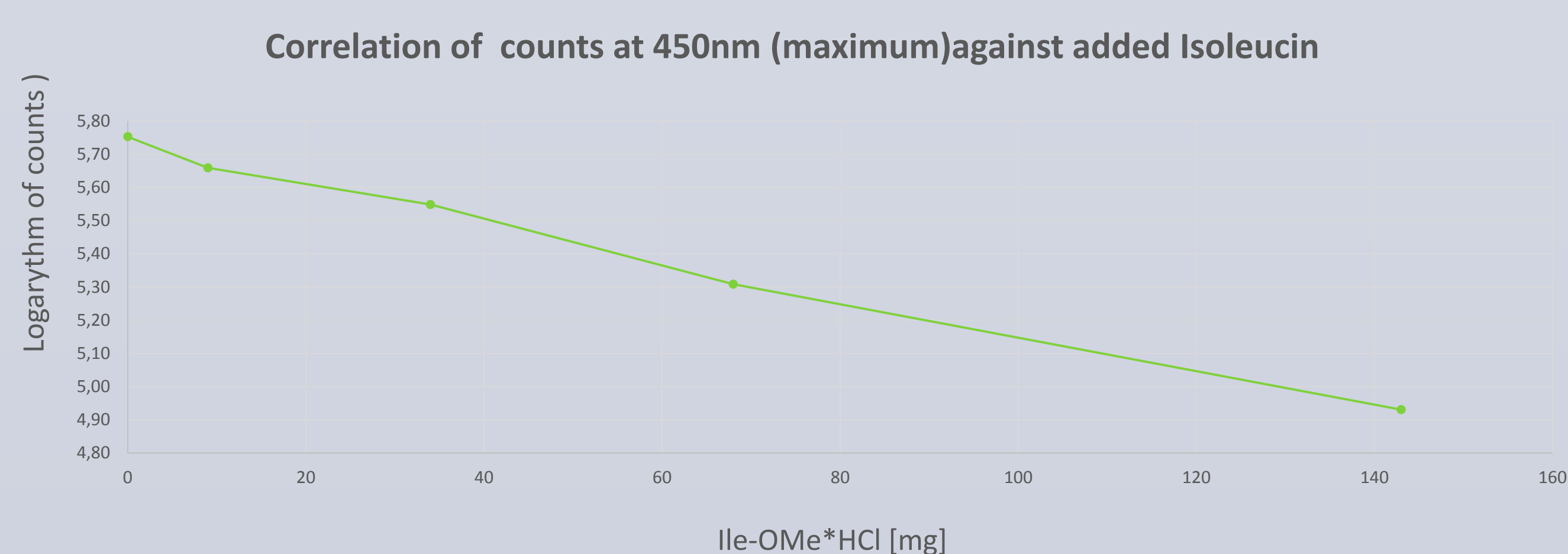
The interaction of these molecules with amino acids and peptides were investigated by fluorescence-emission spectroscopy. An influence of the responds of the measurement were observed; especially fluorescence-emission spectroscopy [5, 6, 7]. These method could be used for the detection of macromolecular acceptors, e.g. surface molecules of tumoral cells.

1,3-Di-[(6-Methoxy-chinolin-4-yl)carbonyl]-*tert*-butyl-calix[4]arene

The mesurment of 1,3-Di-[(6-Methoxy-chinolin-4-yl)carbonyl]-*tert*-butyl-calix[4]arene was recorded from 358nm to 900nm (time: 1.0 sec; c_{Calix} : 0.25mg/ml;). To this probe was added Isoleucinmethyl ester * Hydrochloride (7mg, 34mg, 68mg, 143mg). Isoleucinmethyl ester * hydrochloride has practicaly no emission.

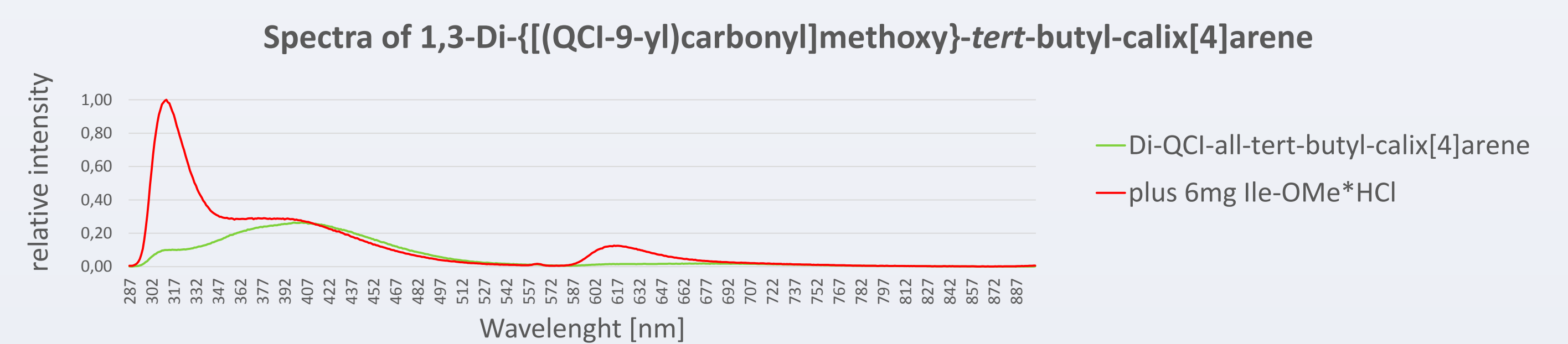


The 1,3-Di-[(6-methoxy-chinolin-4-yl)carbonyl]-*tert*-butyl-calix[4]arene has a broad emission at 450nm and a weaker one at 700nm. The absolut value of 565000 counts is very strong. After the addition of Isoleucinmethyl ester * hydrochloride was a *quenching* effect of observed.

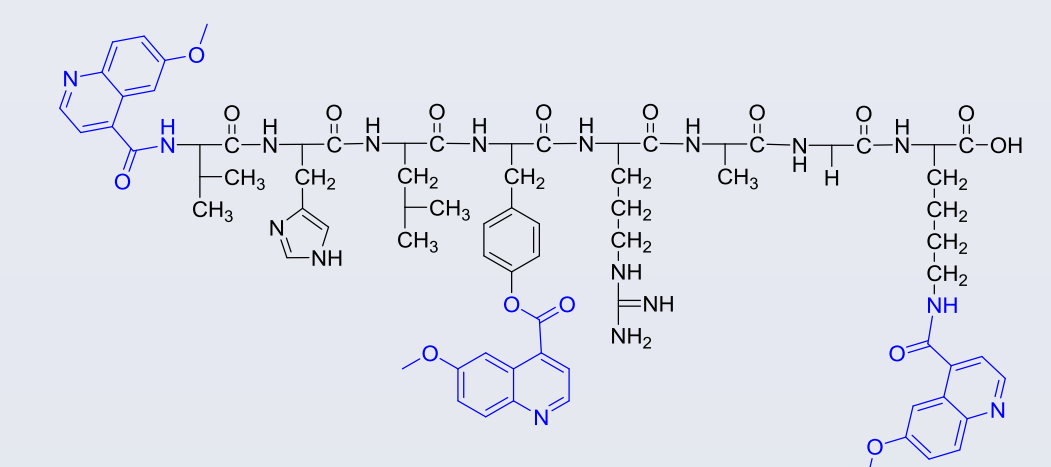


1,3-Di-[(QCI-9-yl)carbonyl]methoxy-*tert*-butyl-calix[4]arene

The mesurment of 1,3-Di-[(QCI-9-yl)carbonyl]methoxy-*tert*-butyl-calix[4]arene was recorded from 283nm to 900nm (time: 0.8 sec; c_{Calix} : 0.5mg/ml;). To this probe was added Isoleucinmethyl ester * Hydrochloride ($C_{\text{amino acid}}$: 1.5mg/mL).

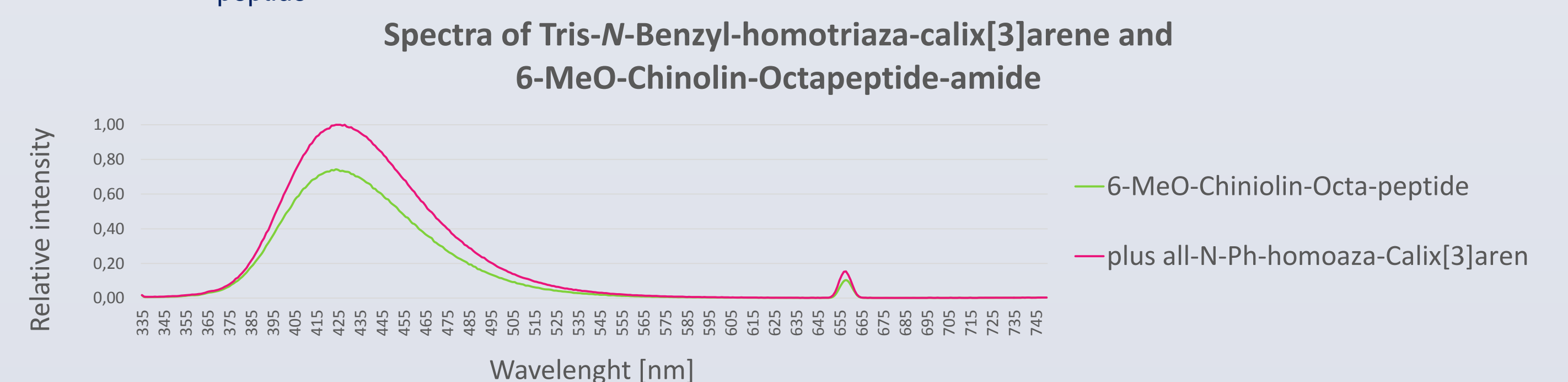


1,3-Di-[(QCI-9-yl)carbonyl]methoxy-*tert*-butyl-calix[4]arene amide shows a broad emission at 405nm. The absolut value of 96000 counts is middle. Furthermore was a shoulder at 310nm and a weak emmission at 650nm observed. After the addition of Isoleucinmethyl ester * hydrochloride was a *turn on* effect of the shoulder observed. The emission of the shoulder at 310nm arised. The absolut value was 360000 counts. This is ten times higher than without the amino acid. Furthermore it appeared a broad weak emission at 610nm. Isoleucinmethyl ester * hydrochloride has practicaly no emission.



Tris-*N*-Benzyl-homotriaza-calix[3]arene

The mesurments of Tris-*N*-Benzyl-homotriaza-calix[3]arene and 6-Methoxy-octapeptide amide were recorded from 335 nm to 900 nm (time: 0.9 sec; c_{Calix} : 0.25mg/ml; C_{peptide} : 0.25mg/mL).



6-Methoxy-octapeptide amide shows an emission at 425nm. The absolut value of 180000 counts is strong. Furthermore was an weak emmission at 650nm detected. After the addition of Tris-*N*-Benzyl-homotriaza-calix[3]arene was a *turn on* effect of around 33% observed. Tris-*N*-Benzyl-homotriaza-calix[3]arene itself shows practicaly no emission.

CONCLUSIONS

Fluorescence active compounds were investigated. *Turn on* and *quenching* effects were observed by adding non-active compounds. These can be used for detection of these non-active compounds like Isoleucine.

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