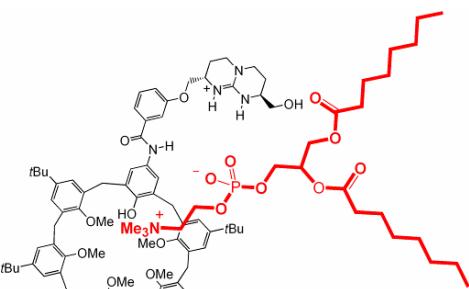
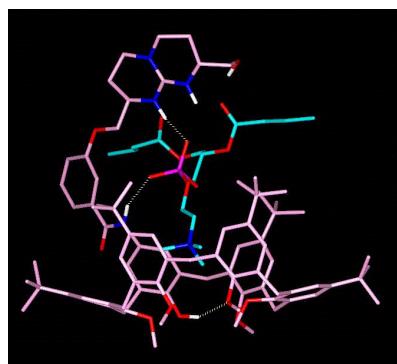
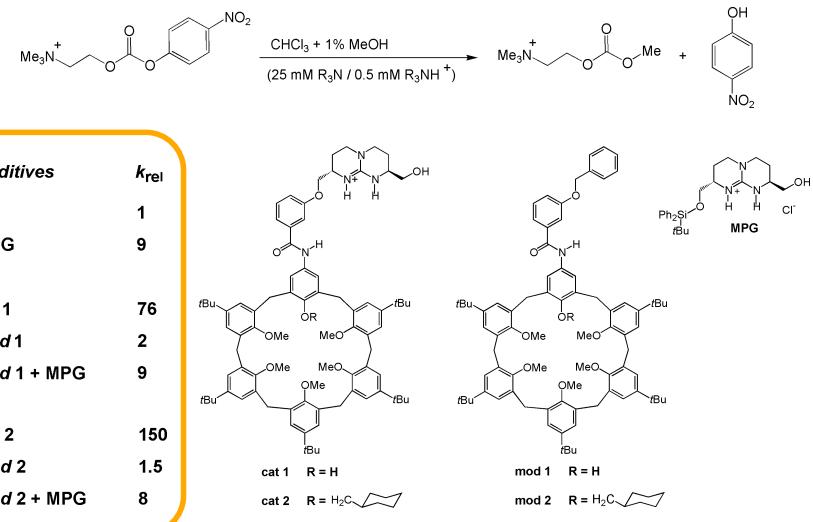


## Towards an Artificial Acetylcholinesterase



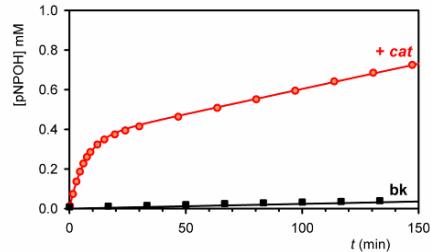
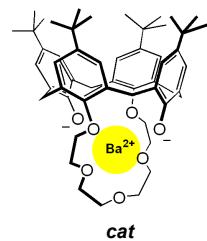
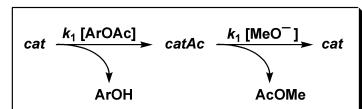
J. O. Magrans, A. R. Ortiz, A. Molins, P. H. P. Lebouille, J. Sánchez-Quesada, P. Prados, M. Pons, F. Cago, J. de Mendoza, *Angew. Chem. Int. Ed.* **1996**, 35, 1712-1715.

## Towards an Artificial Acetylcholinesterase



F. Cuevas, S. Di Stefano, J. O. Magrans, P. Prados, J. de Mendoza, L. Mandolini *Chem. Eur. J.* **2000**, 6, 3228

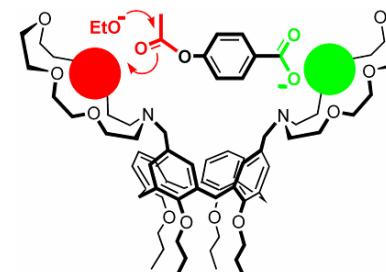
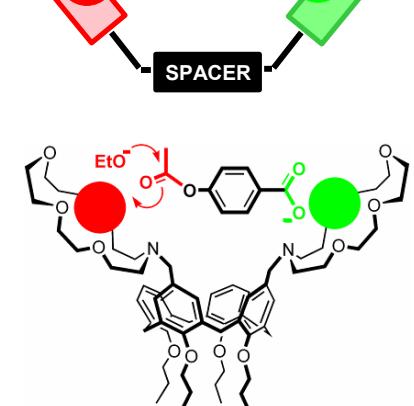
## A calix-crown based artificial transacylase



R. Cacciapaglia, A. Casnati, L. Mandolini, R. Ungaro *J. Am. Chem. Soc.* **1992**, 114, 10956.

## Calixarenes as molecular platforms

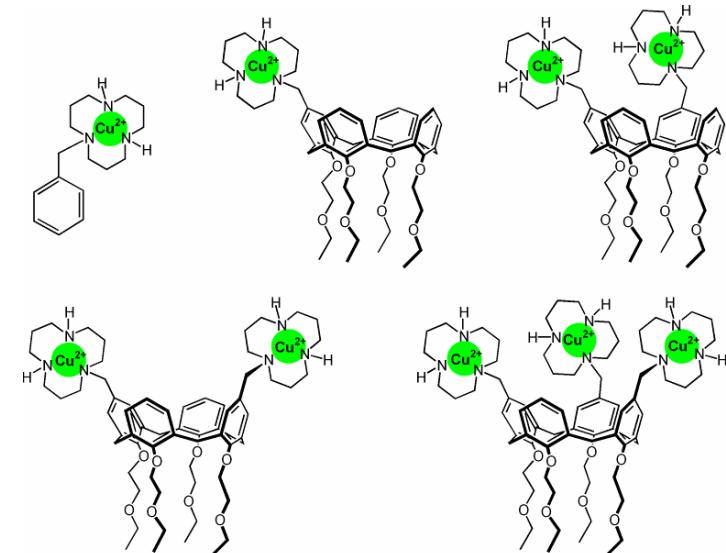
CATALYTIC SITE      RECOGNITION SITE



**Basic Ethanolysis of Esters: Effects of Mono- and Dinuclear Complexes**  
( $k_{\text{di}}/k_{\text{mono}}$  in parenthesis)

Catalyst				
none	1	1	1	1
	300	20	52	12
	35,100 (120)	22,000 (1,100)	20,000 (385)	170 (14)
	1,340 (4.5)	420 (21)	570 (11)	24 (2)

R. Cacciapaglia, A. Casnati, S. Di Stefano, L. Mandolini, D. Paolemili, D. N. Reinhoudt, A. Sartori, R. Ungaro *Chem. Eur. J.* **2004**, *10*, 4436.



**RNA-dinucleoside monophosphate cleavage**

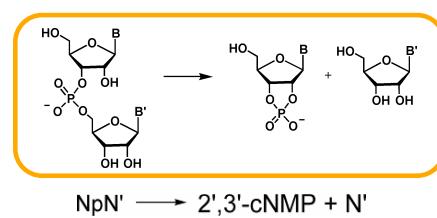
Catalyst	$k_{\text{rel}}$
	1
	160
	1.4
	200

UpU  $\longrightarrow$  2',3'-cUMP + U

$\text{H}_2\text{O}, \quad 50^\circ\text{C}$   
 $\text{pH} = 7.0 \quad (\text{HEPES } 20 \text{ mM})$   
 $[\text{cat}] = 1 \text{ mM}$   
 $[\text{sub}] = 0.1 \text{ mM}$

R. Cacciapaglia, A. Casnati, L. Mandolini, D. N. Reinhoudt, R. Salvio, A. Sartori, R. Ungaro *J. Am. Chem. Soc.* **2006**, *128*, 12322.

**RNA-dinucleoside monophosphate cleavage**

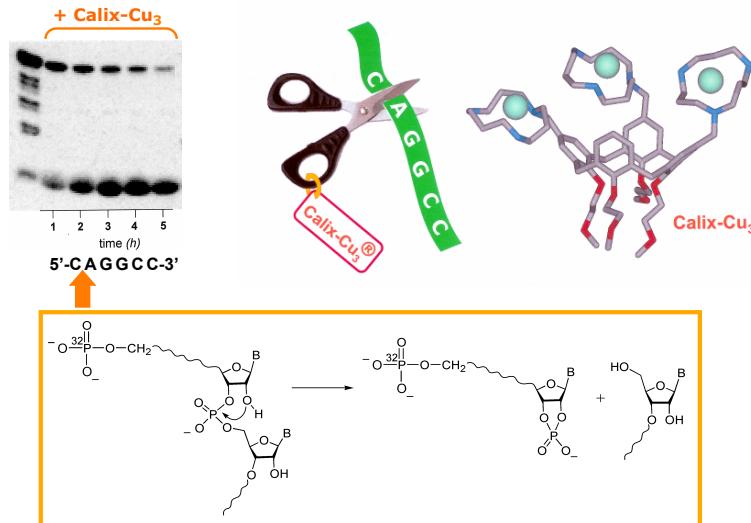


Substrate	$k_{\text{rel}}$
GpA	1
CpA	<0.1
CpG	1.5
ApG	1.9
CpC	1.8
GpG	2.0
GpU	2.6
UpG	30
UpU	39

$k/k_{\text{o}} \approx 10^4 - 10^5$

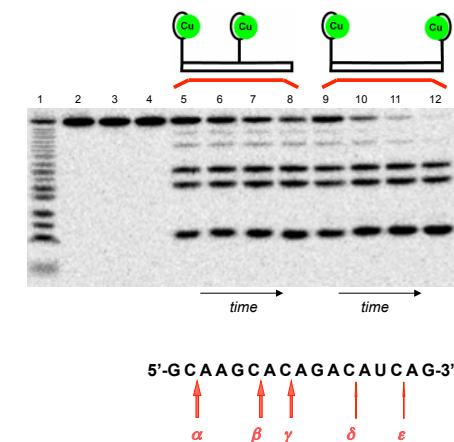
$\text{H}_2\text{O}, \quad 50^\circ\text{C}$   
 $\text{pH} = 7.0 \quad (\text{HEPES } 20 \text{ mM})$   
 $[\text{cat}] = 1 \text{ mM}$   
 $[\text{sub}] = 0.1 \text{ mM}$

### RNA-oligonucleotide cleavage in water



R. Cacciapaglia, A. Casnati, L. Mandolini, A. Peracchi, D. N. Reinhoudt, R. Salvio, A. Sartori, R. Ungaro. *J. Am. Chem. Soc.* **2007**, *129*, 12512.

### RNA-oligonucleotide cleavage in water



water, pH 7.4, 50 °C; 10  $\mu\text{M}$  catalyst, 0.1 nM substrate