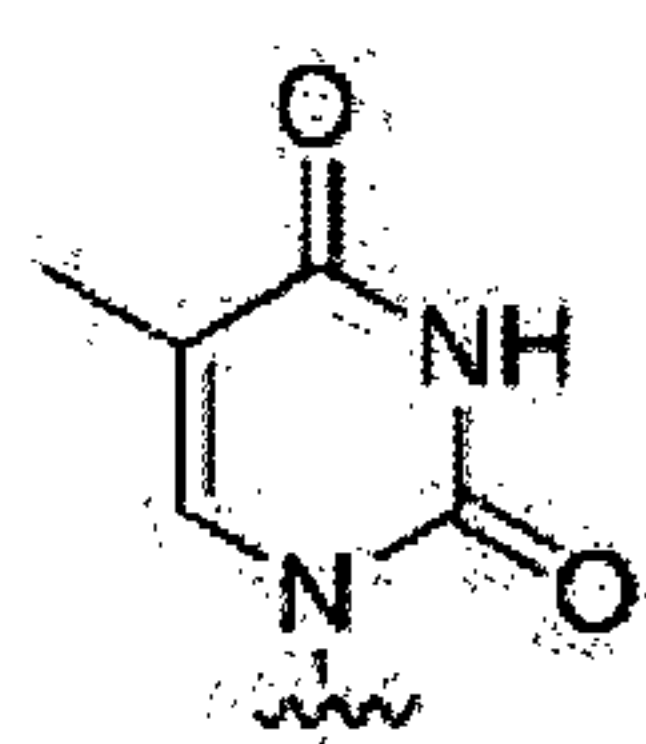
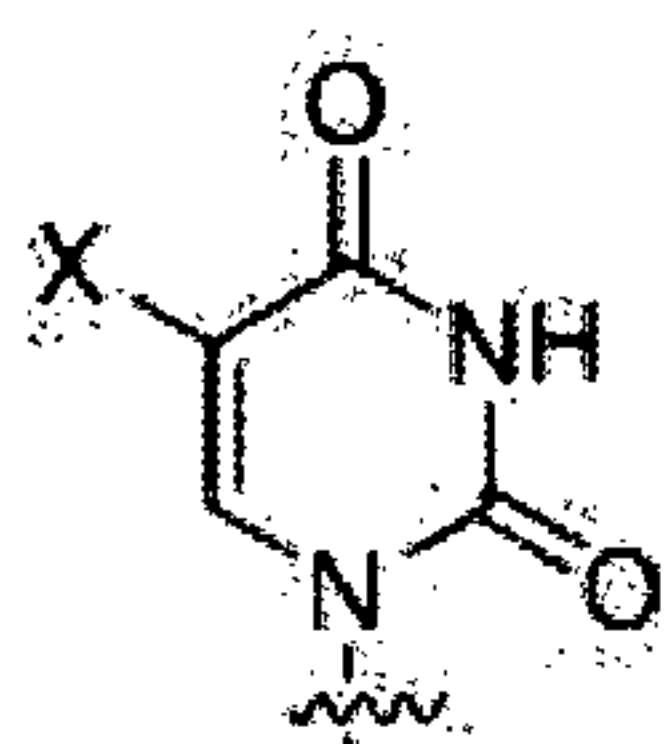


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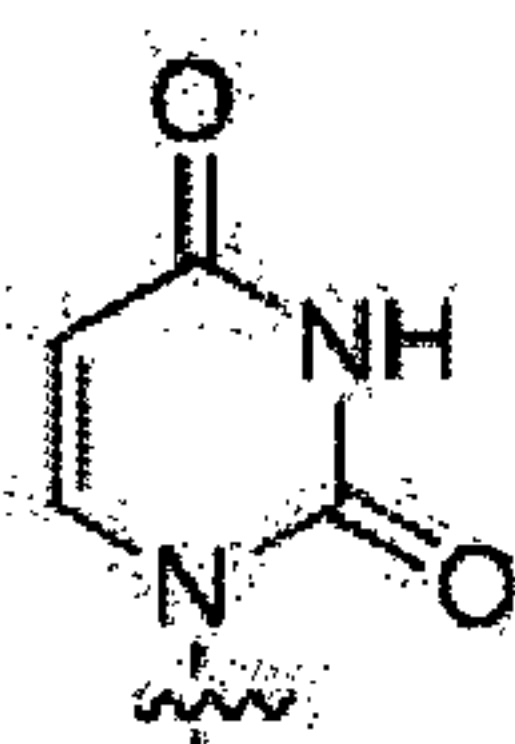
Fig. 1a



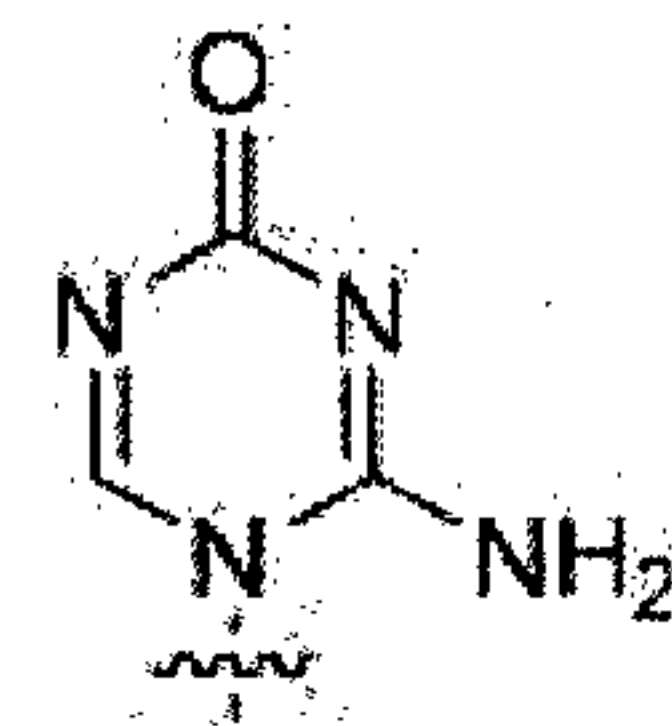
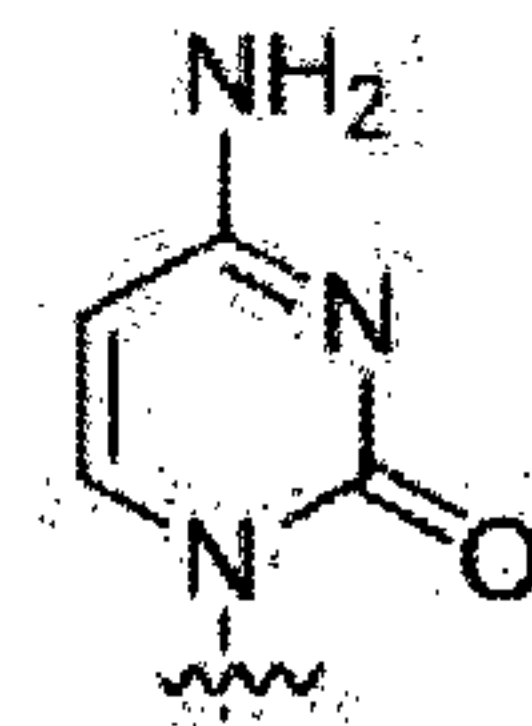
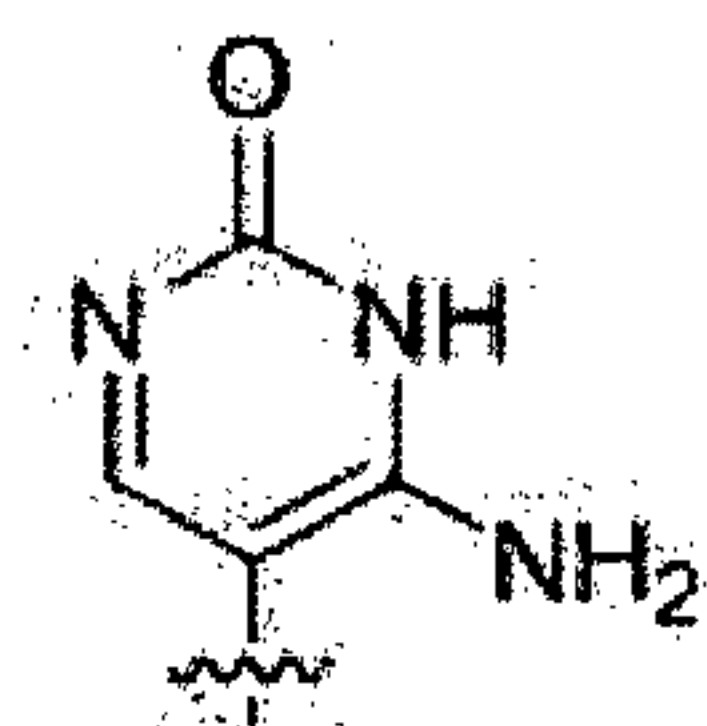
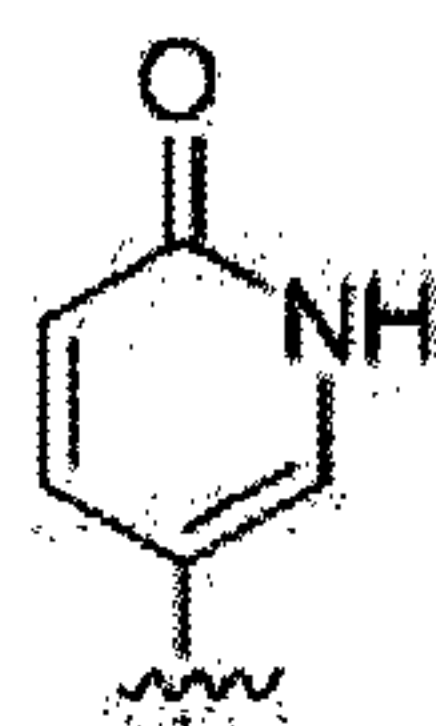
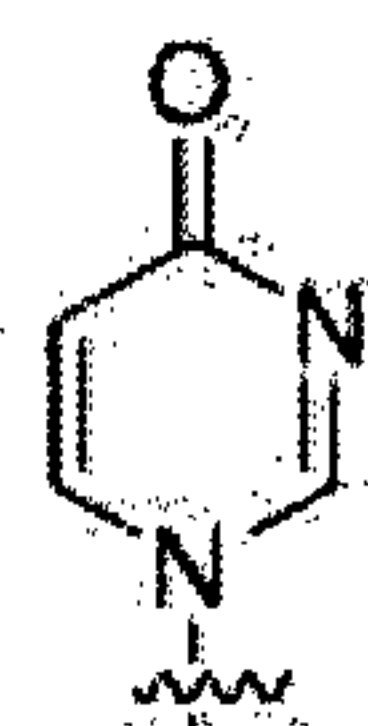
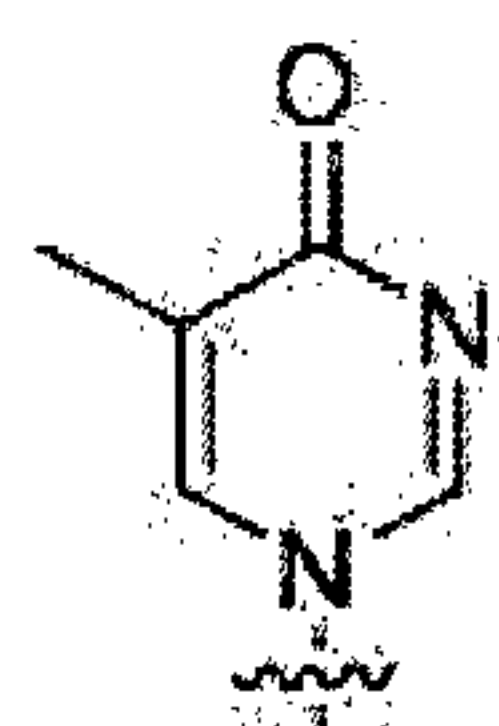
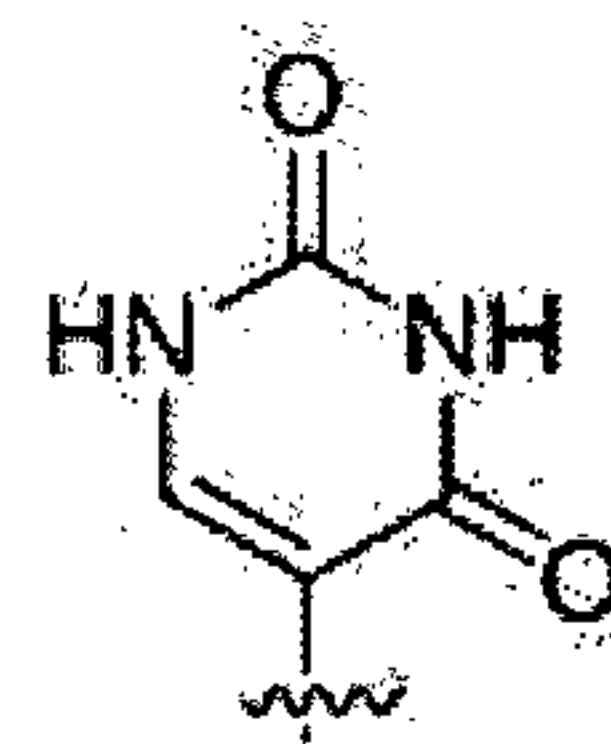
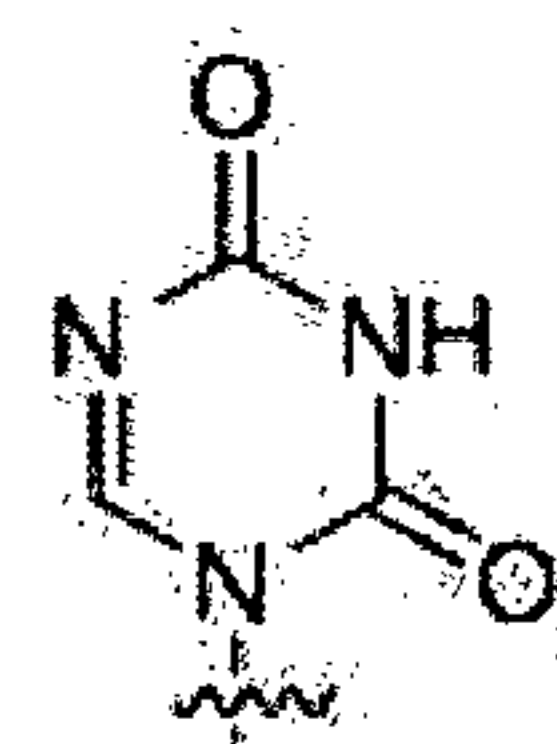
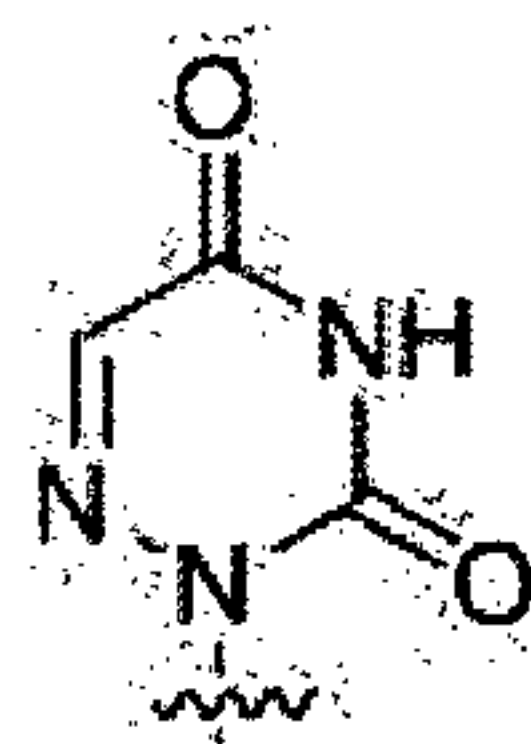
Thymine



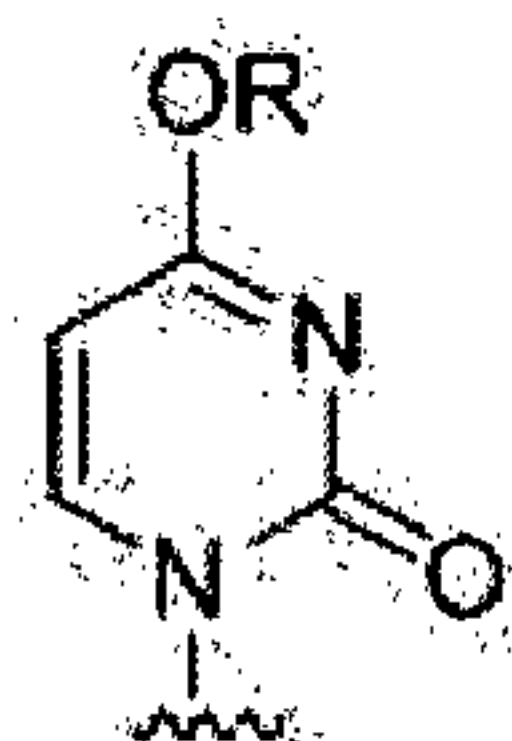
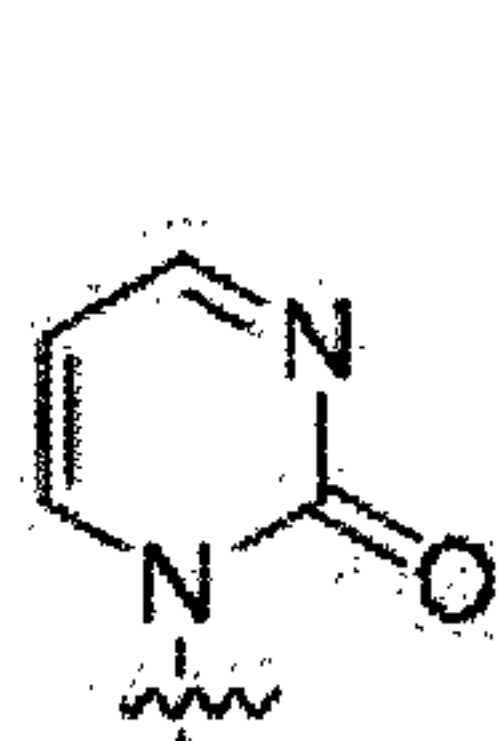
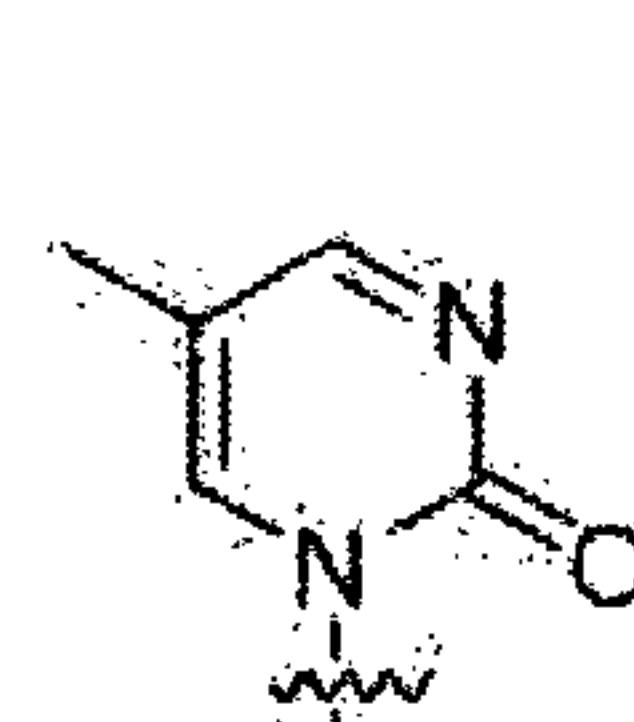
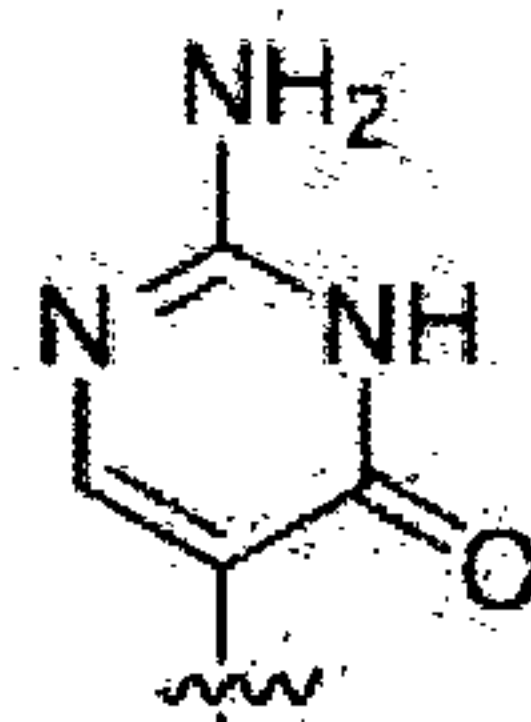
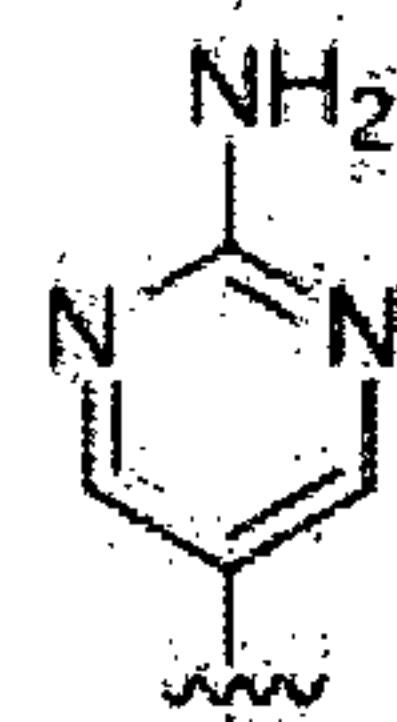
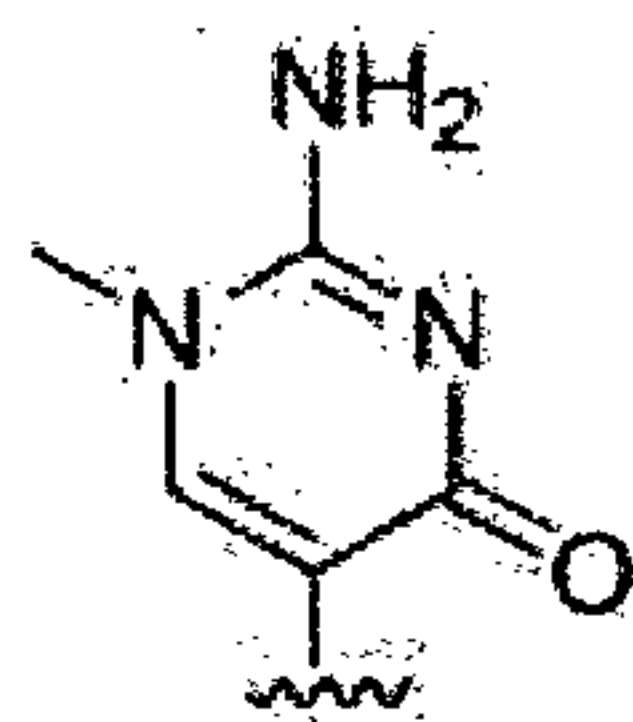
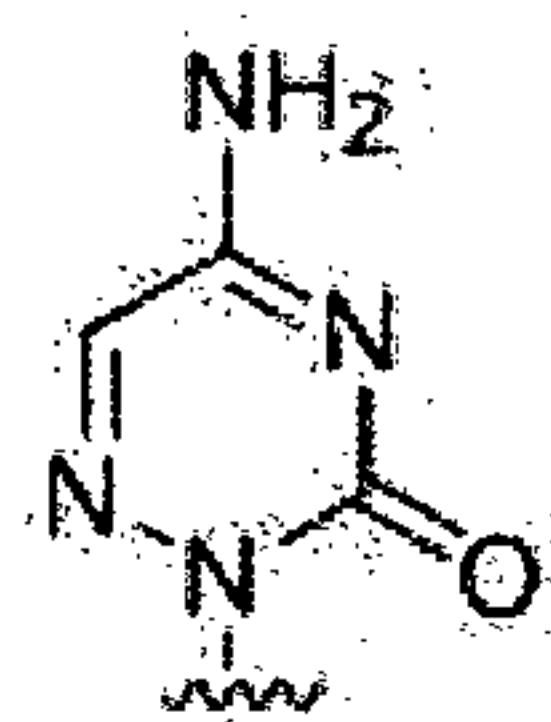
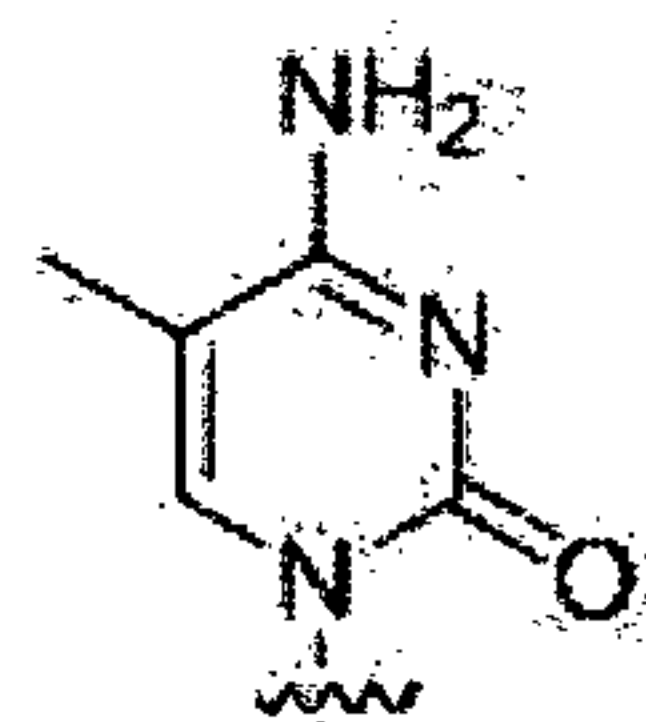
X = F, Cl, Br, or I



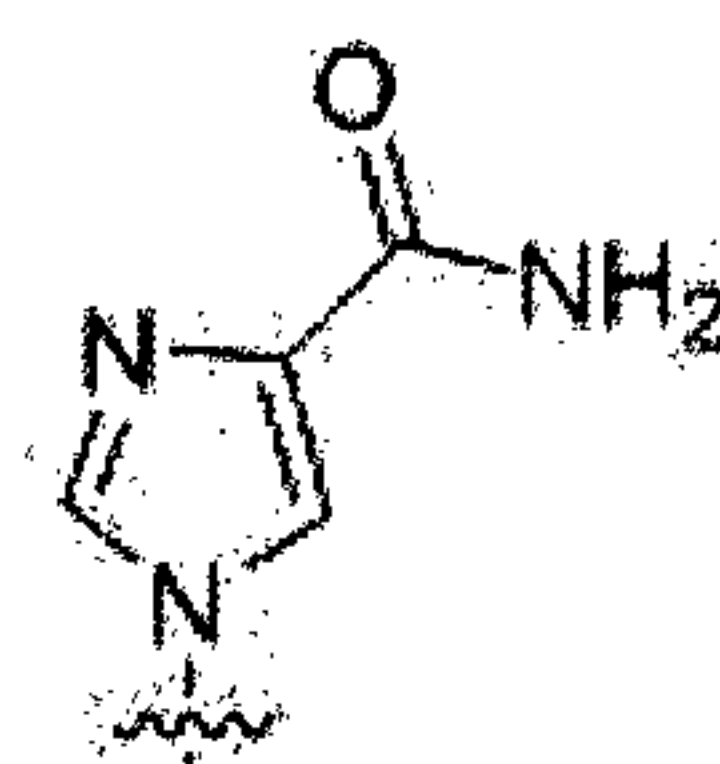
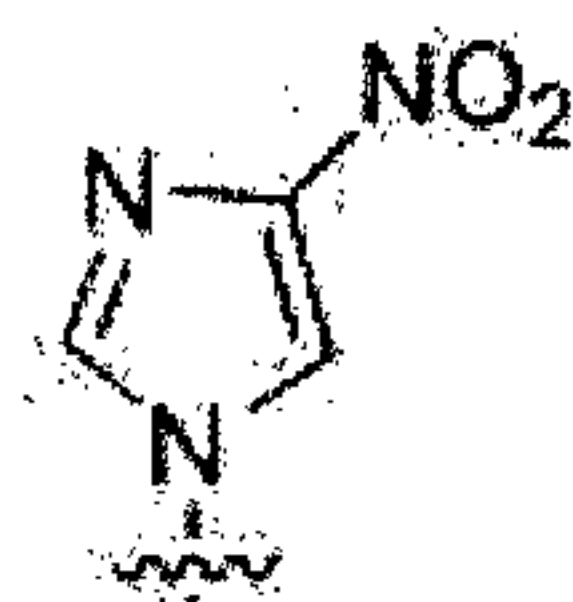
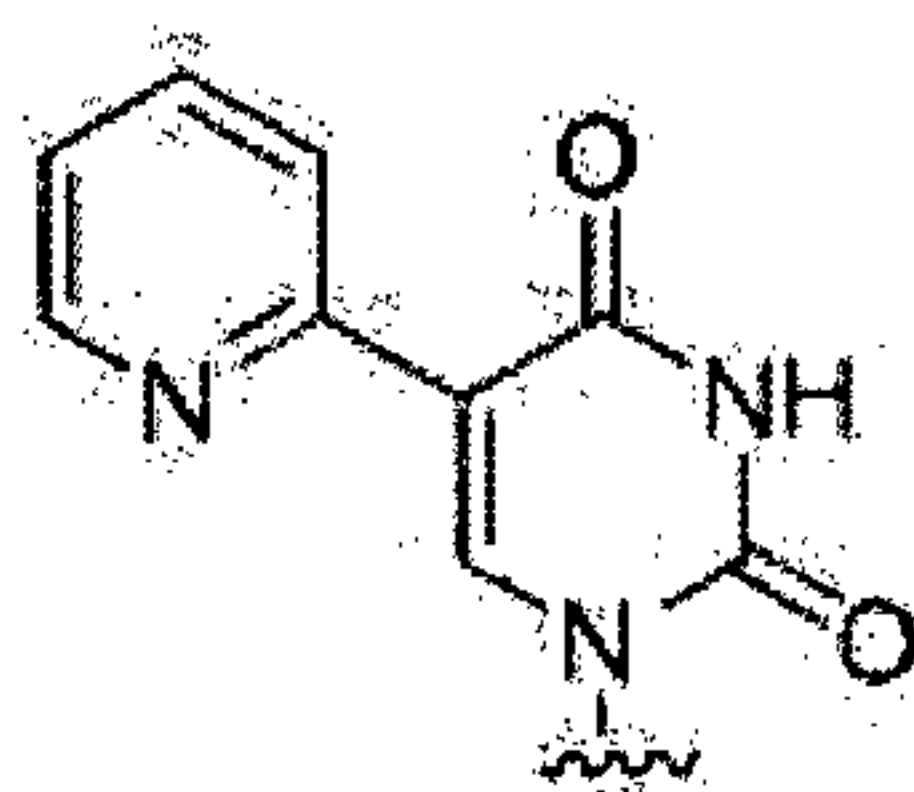
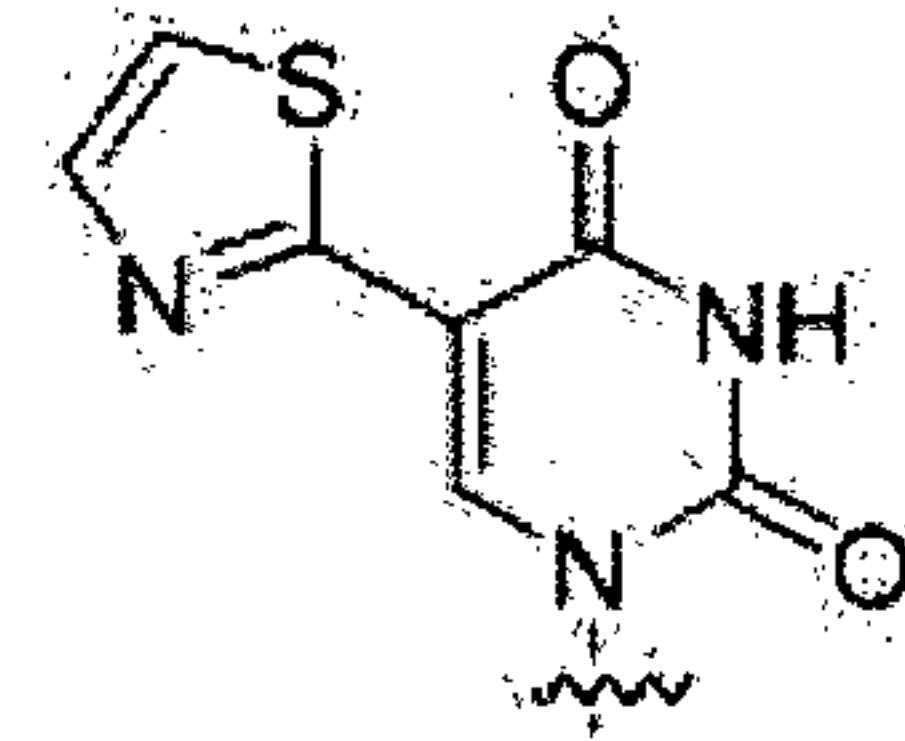
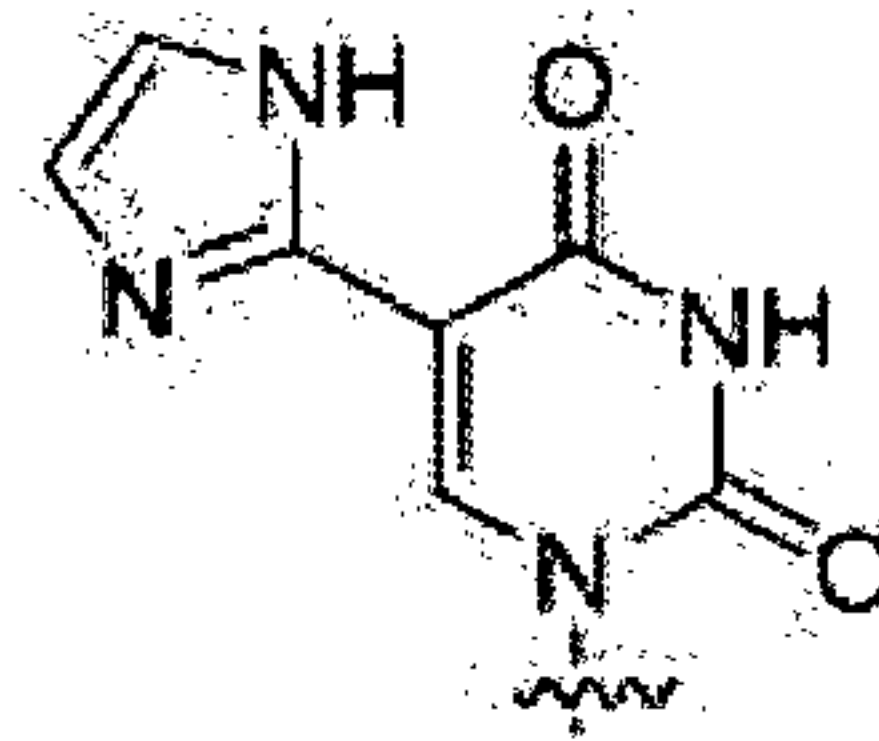
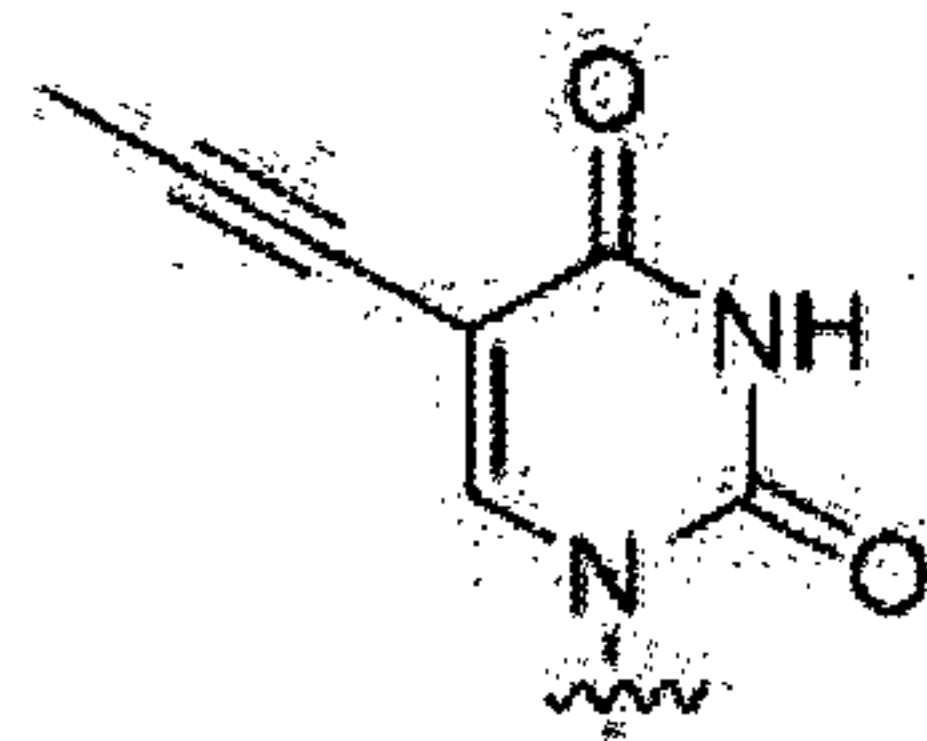
Uracil



Cytosine

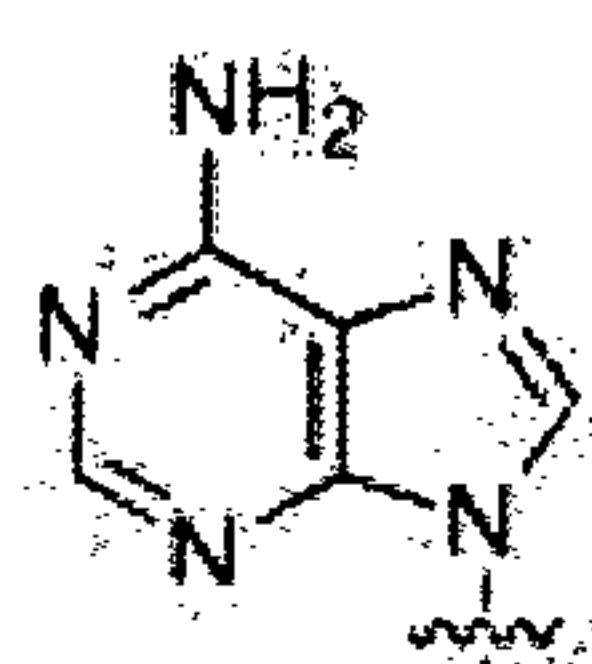


R = alkyl

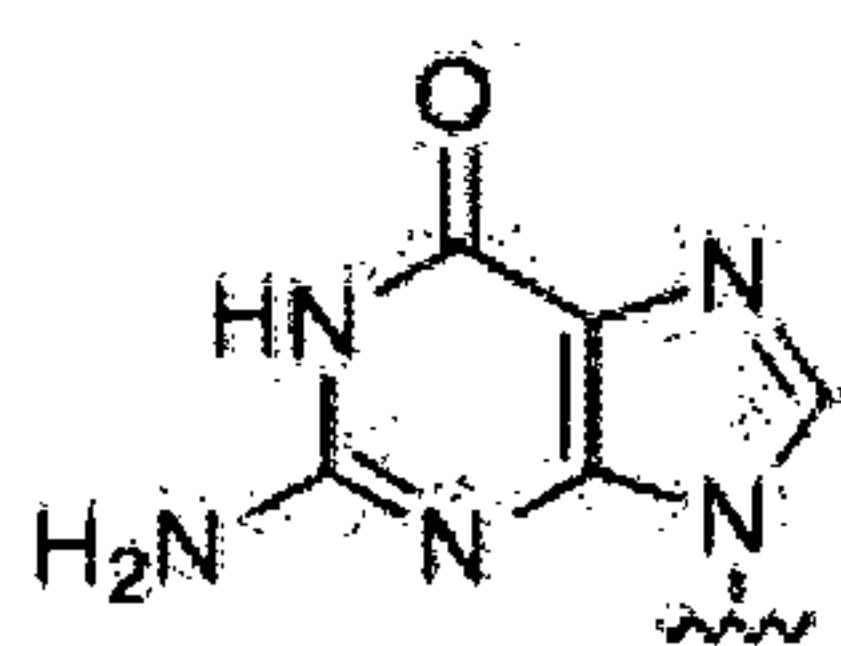
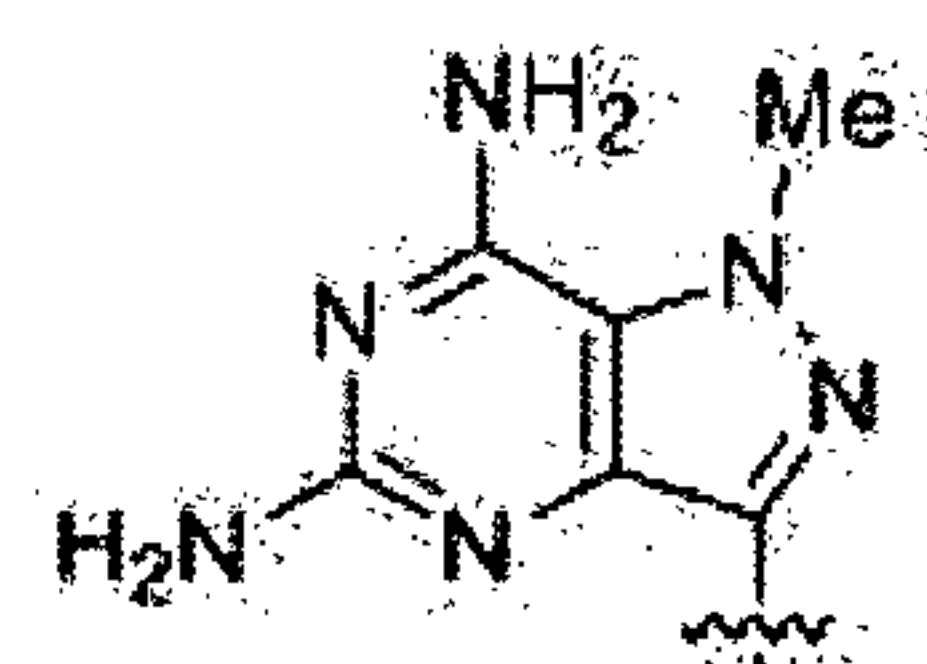
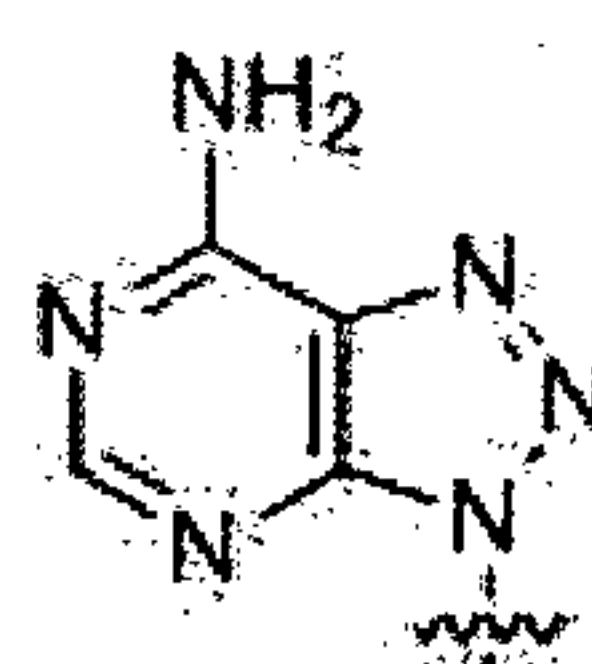
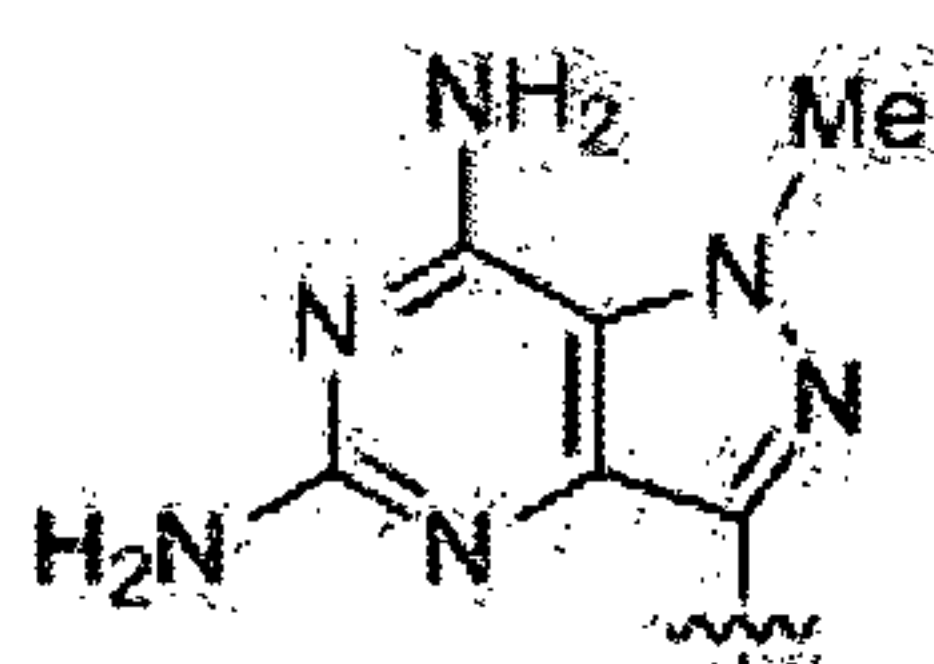
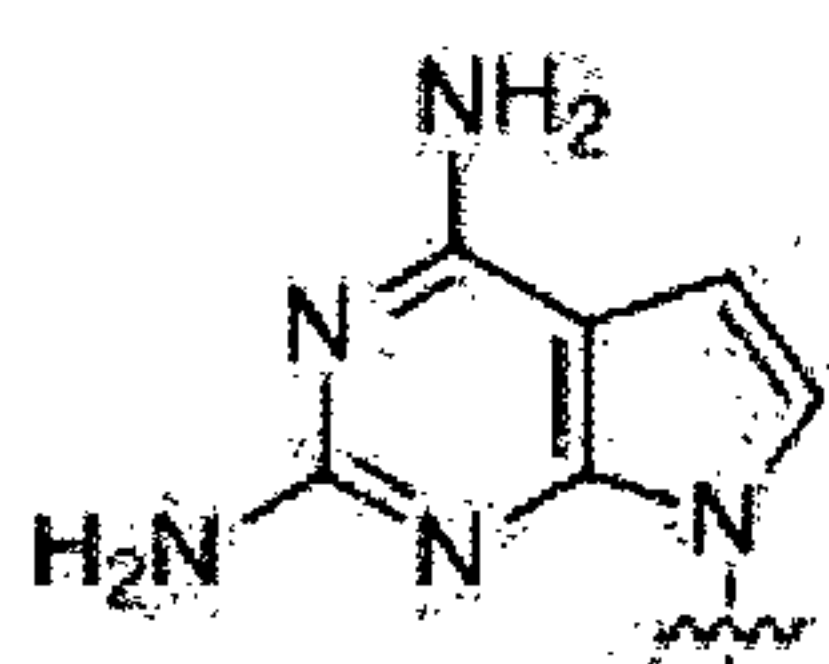


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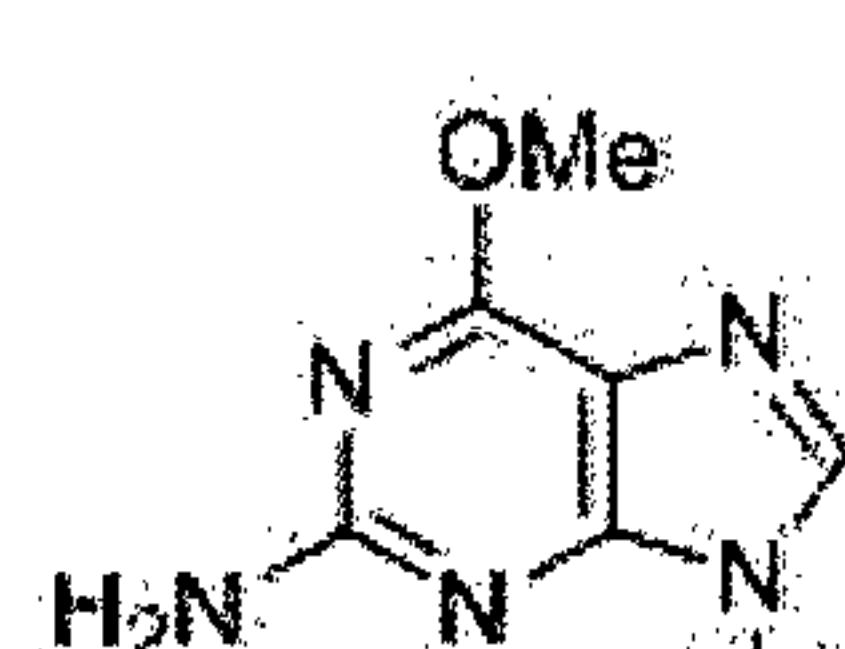
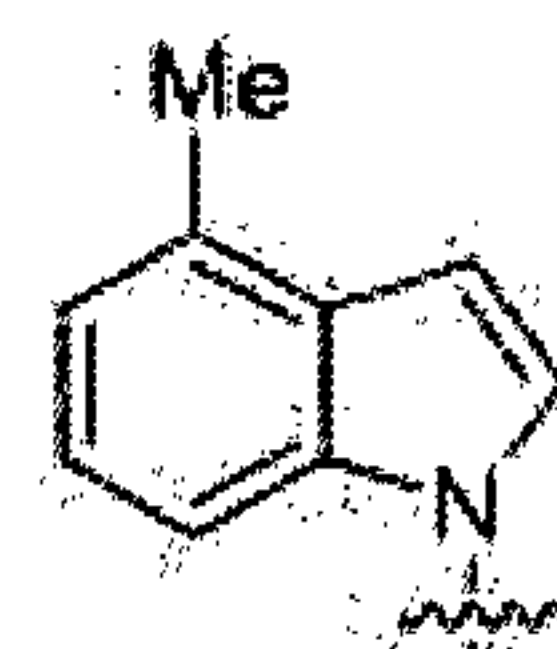
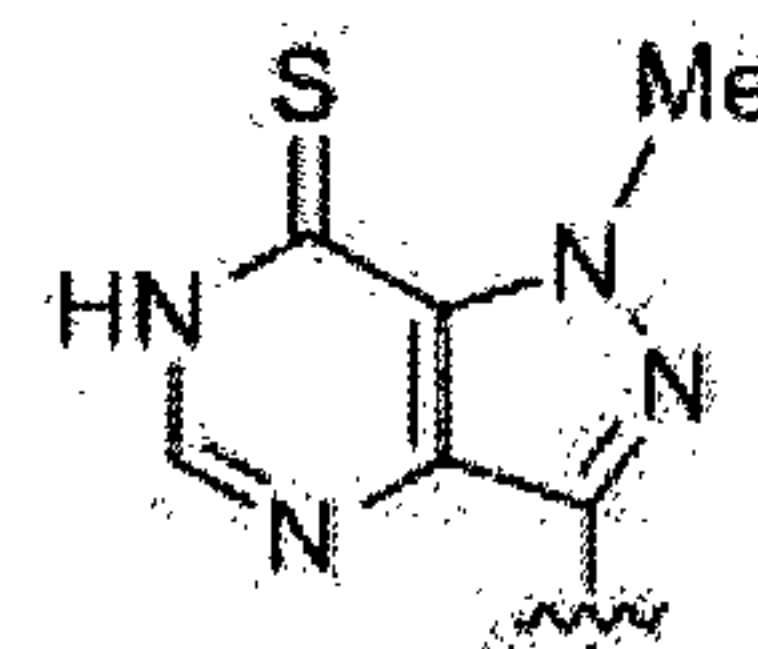
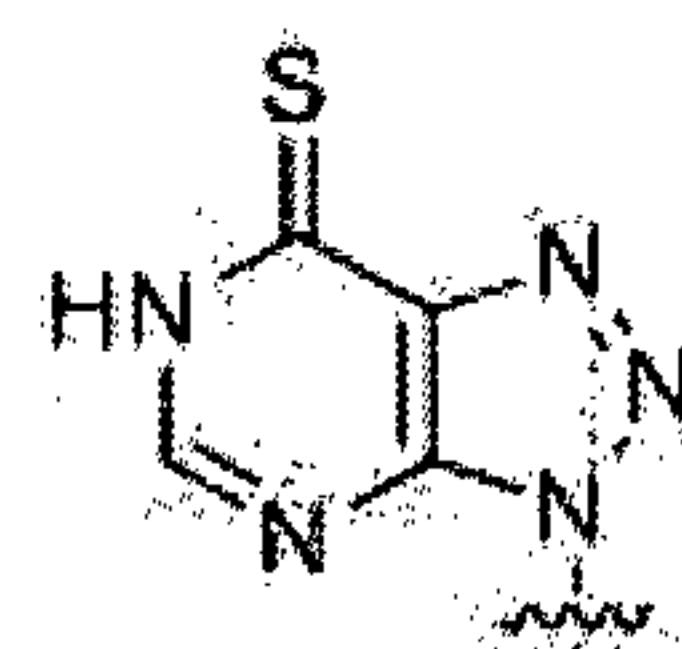
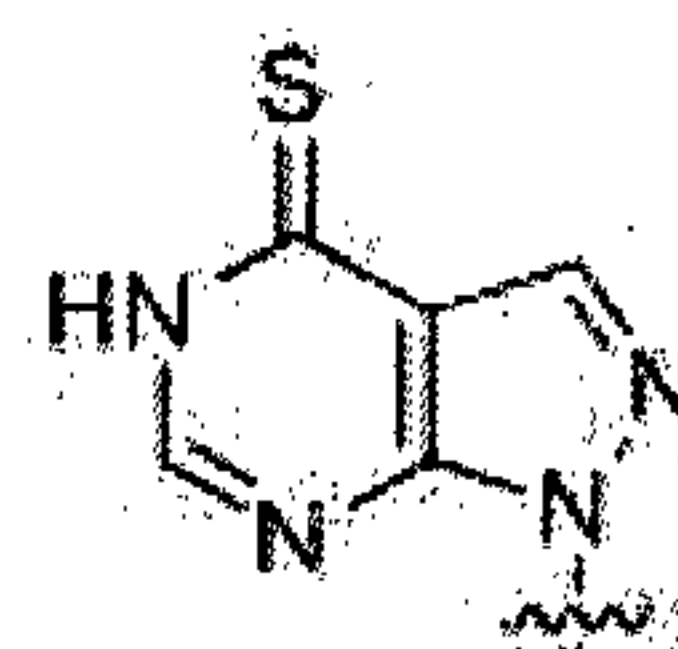
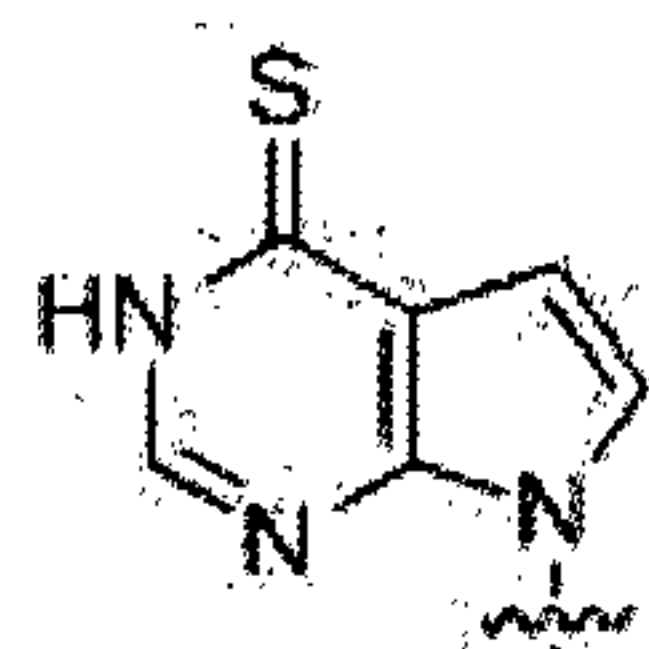
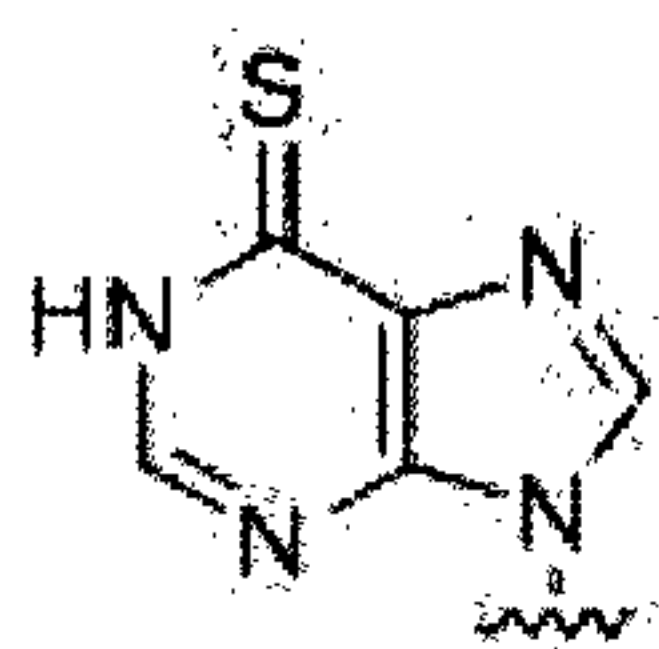
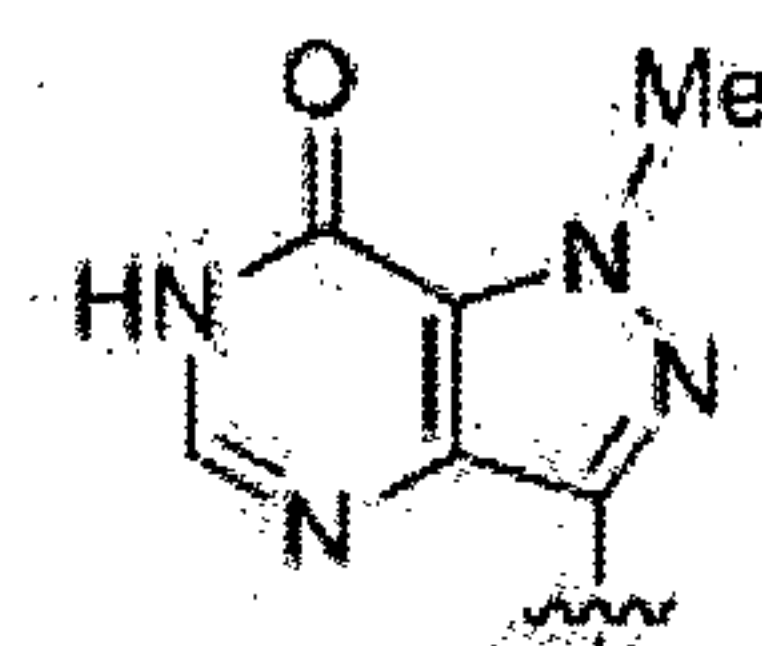
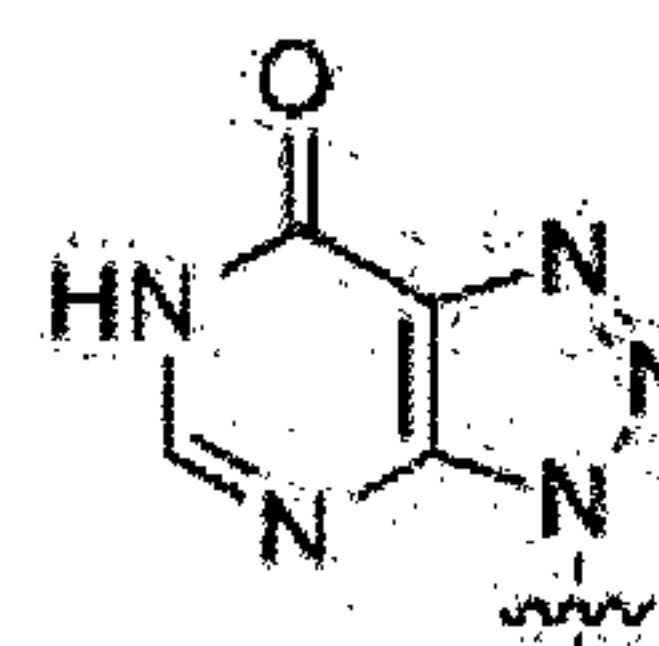
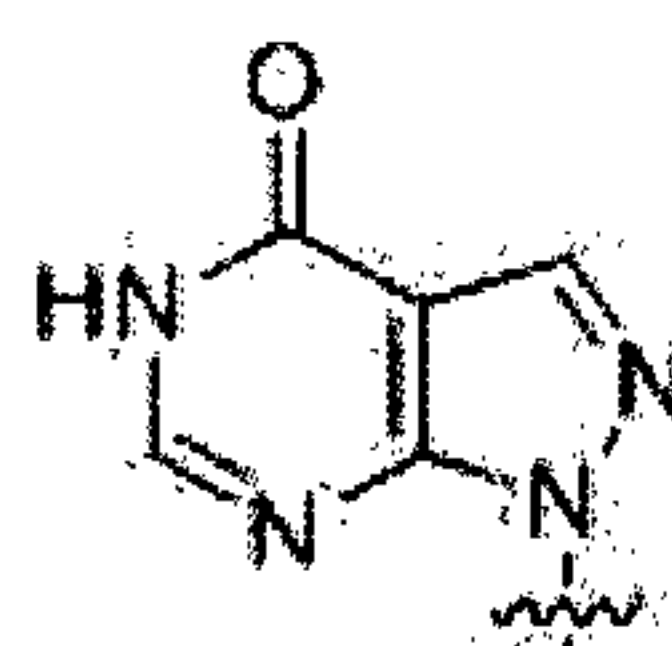
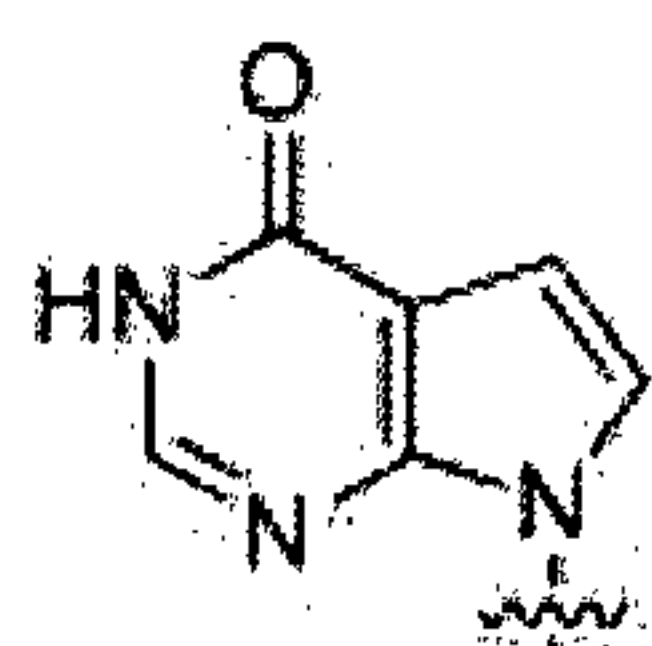
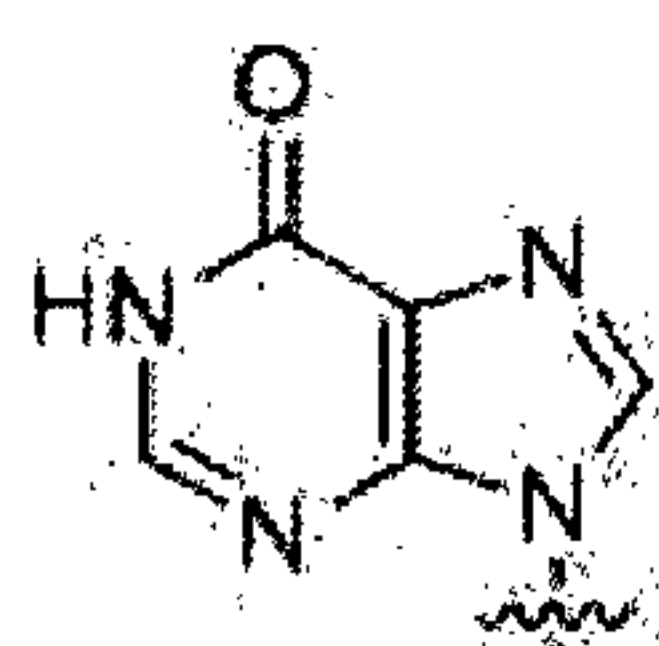
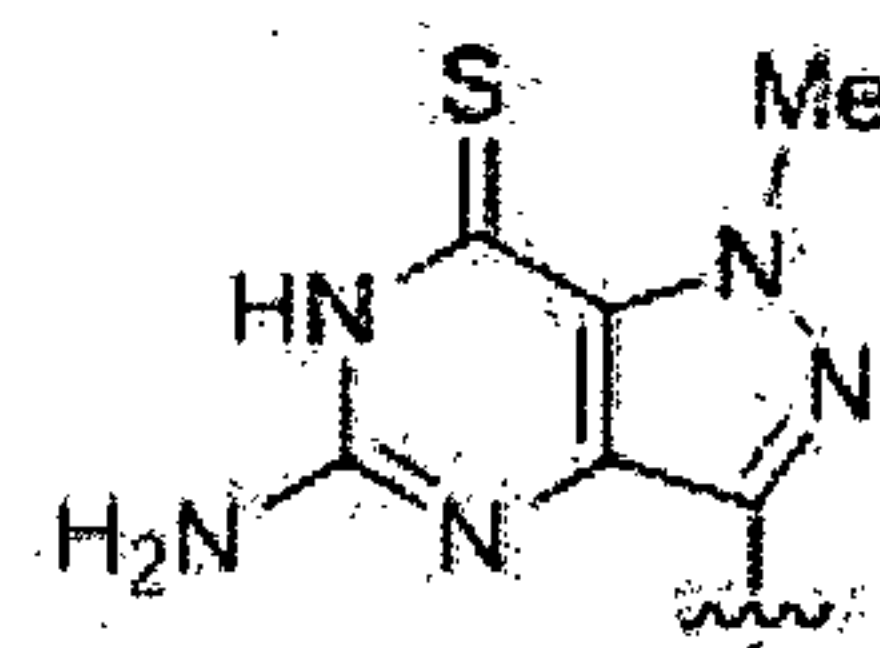
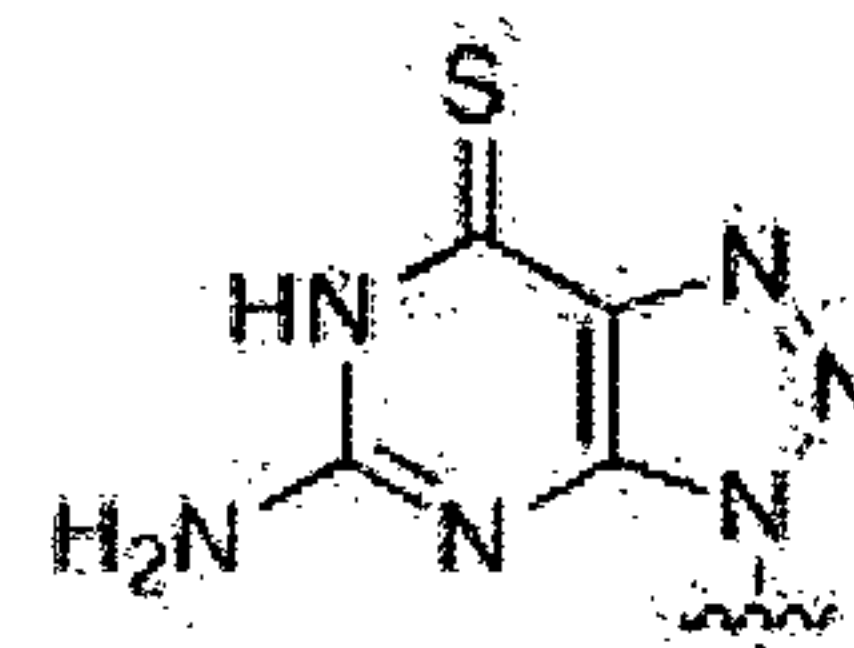
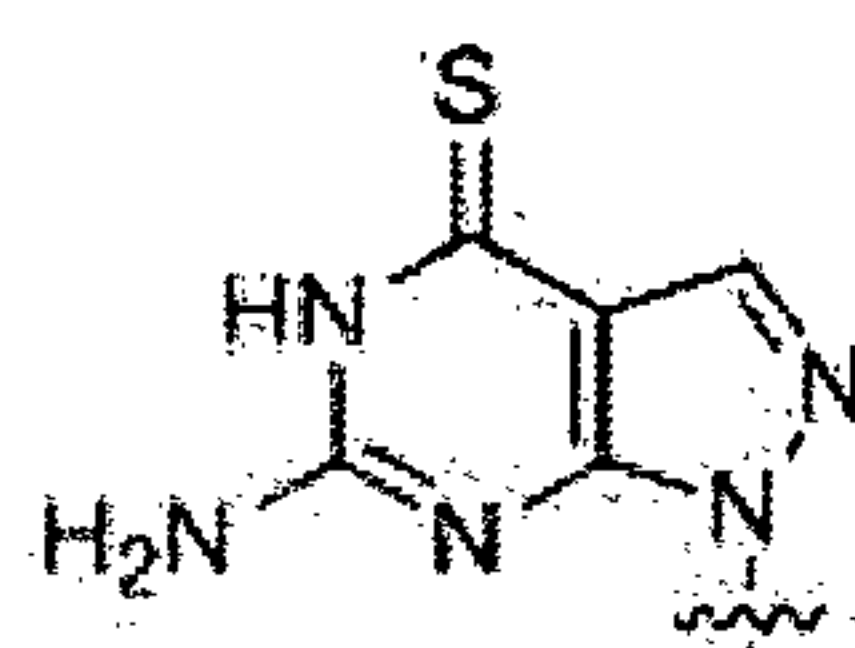
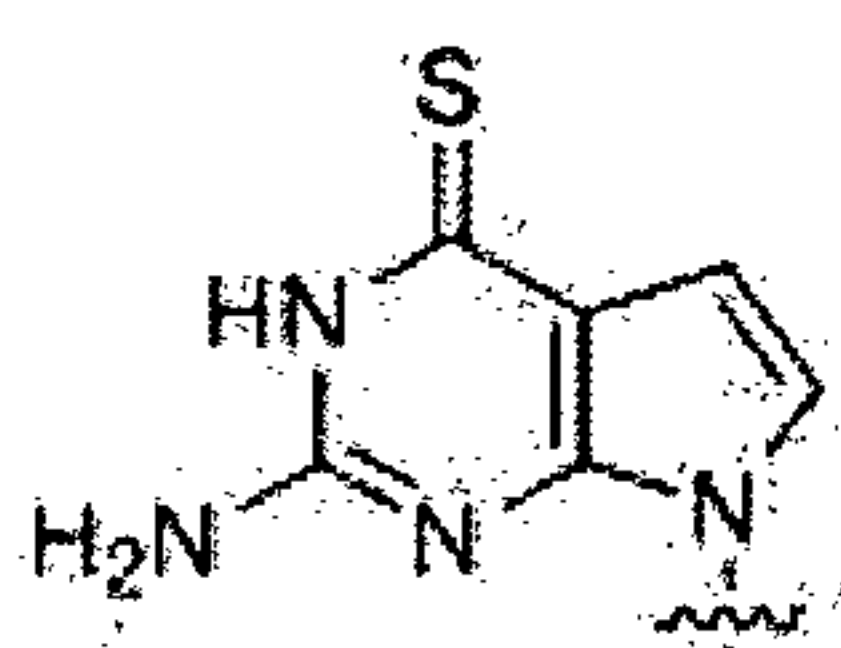
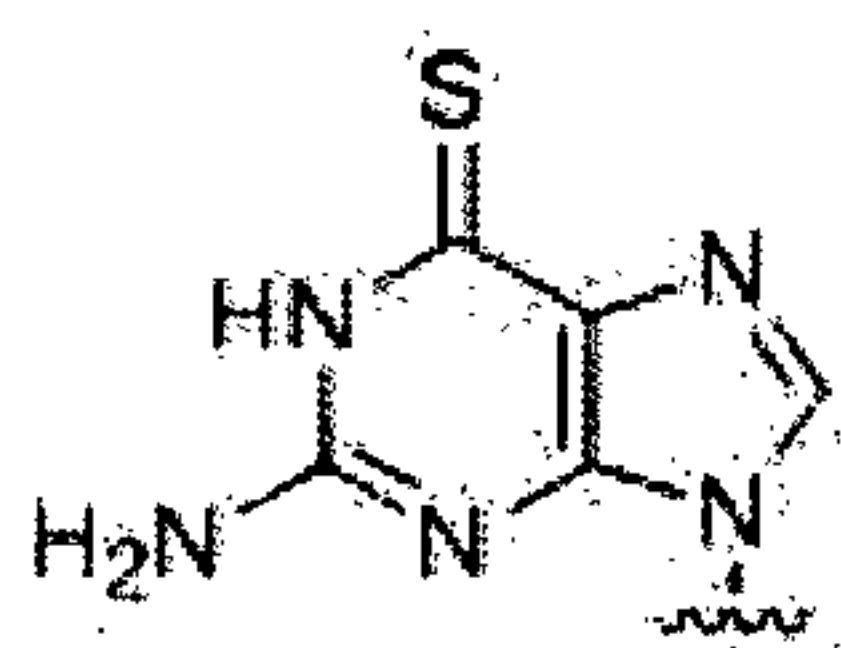
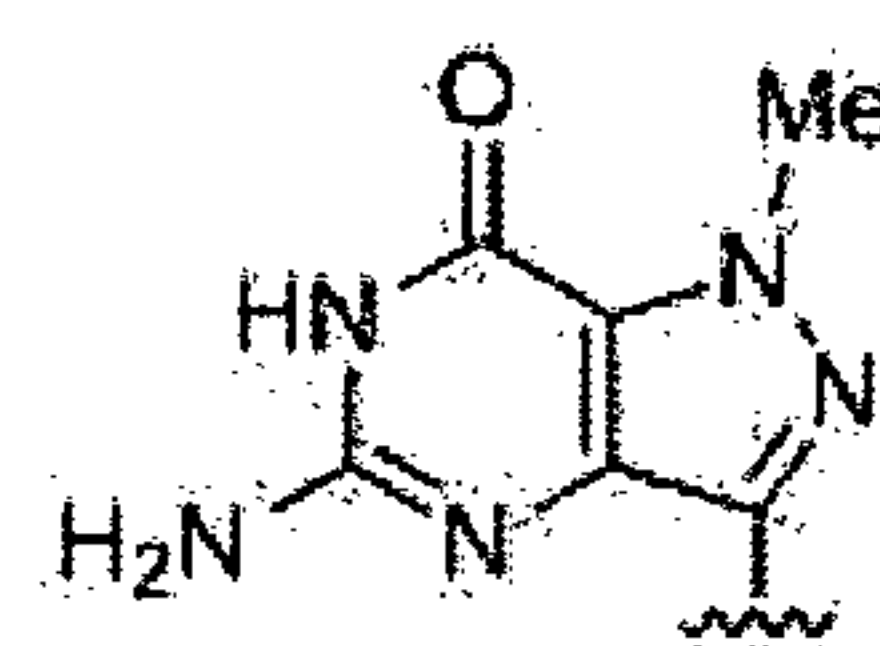
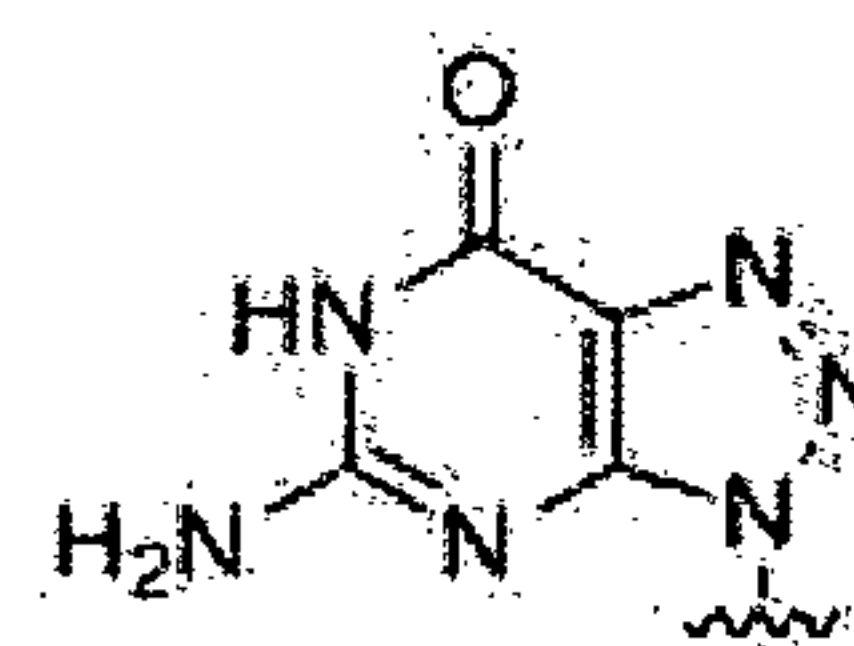
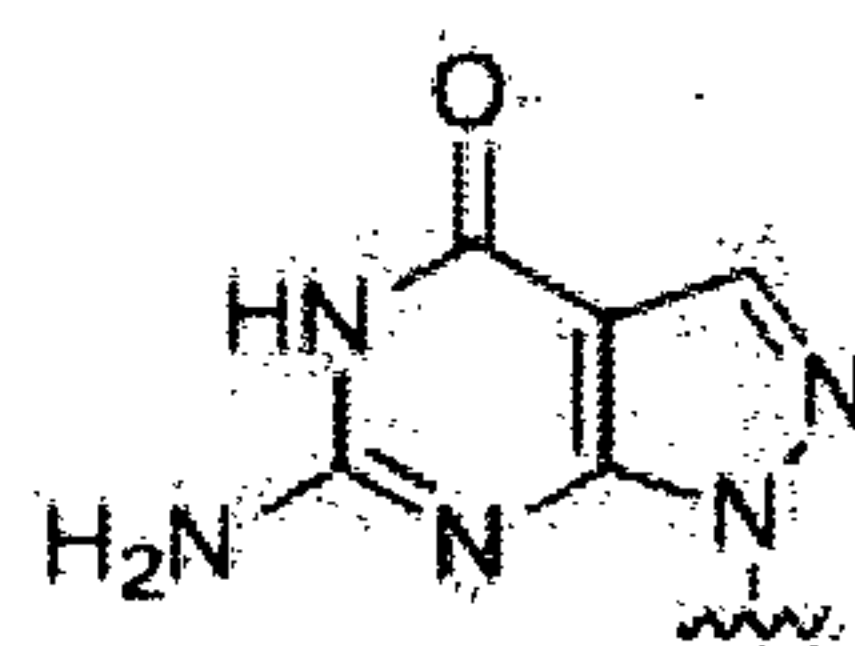
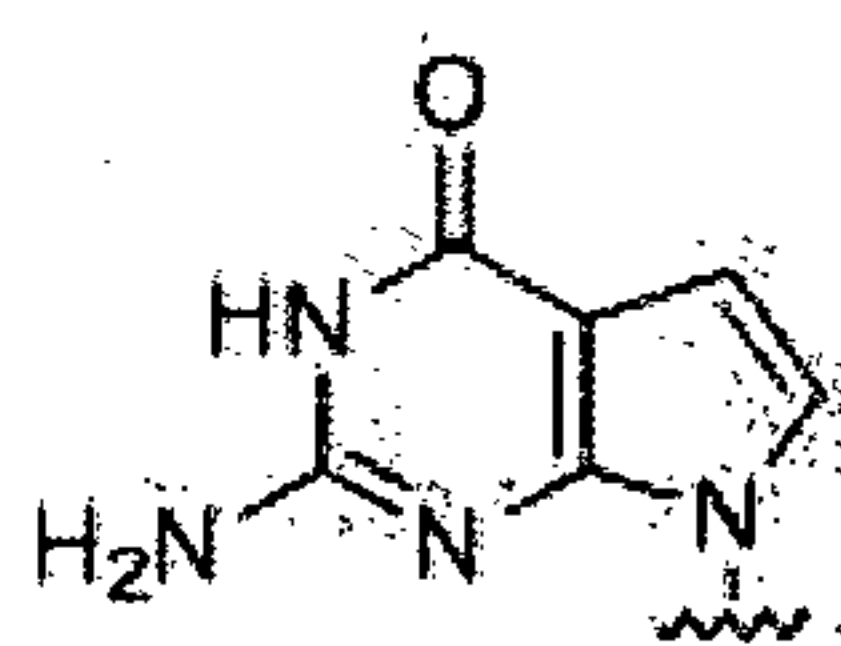
Fig. 1b



Adenine



Guanine



6-O-methylguanine

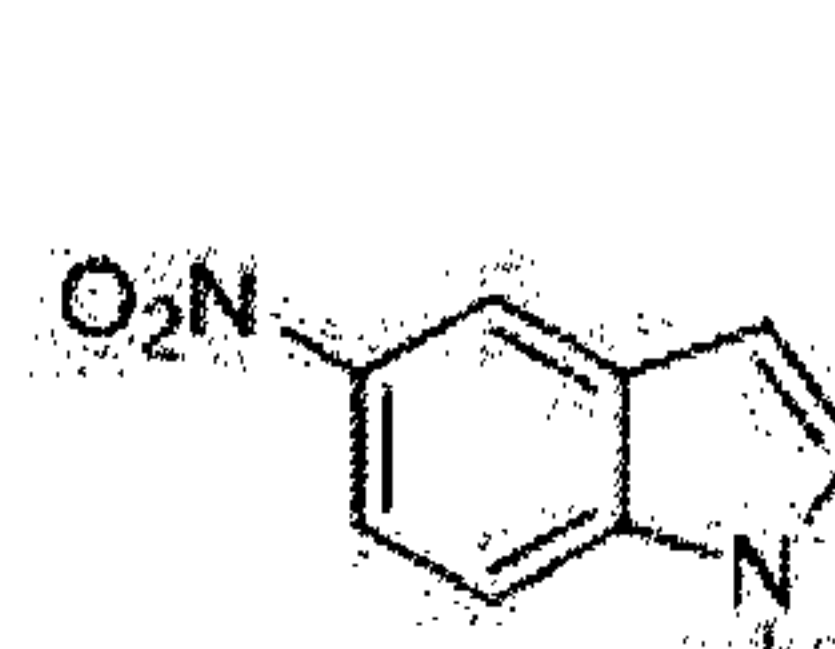
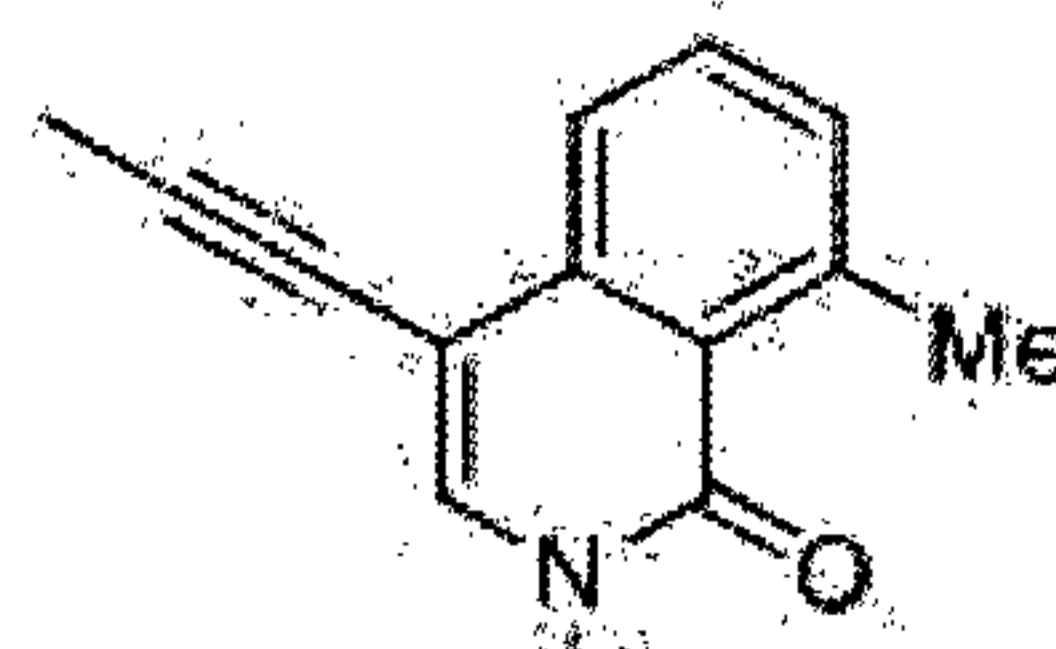
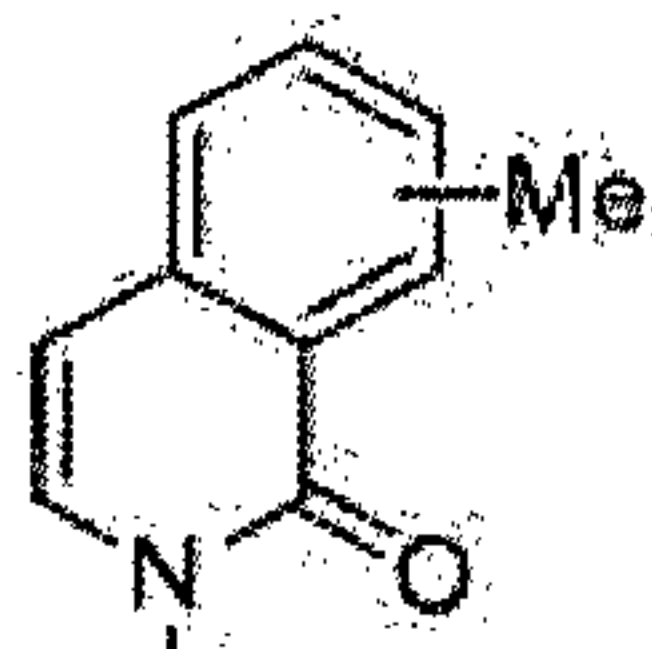
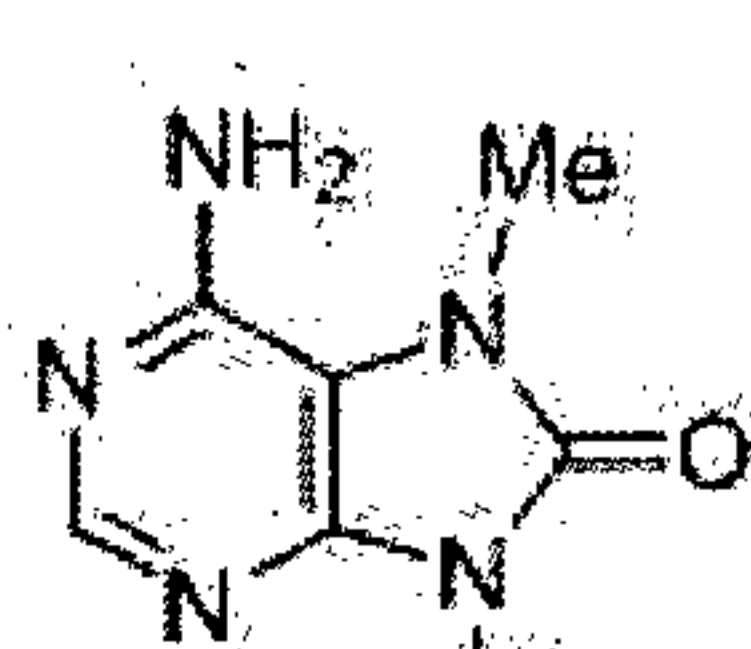
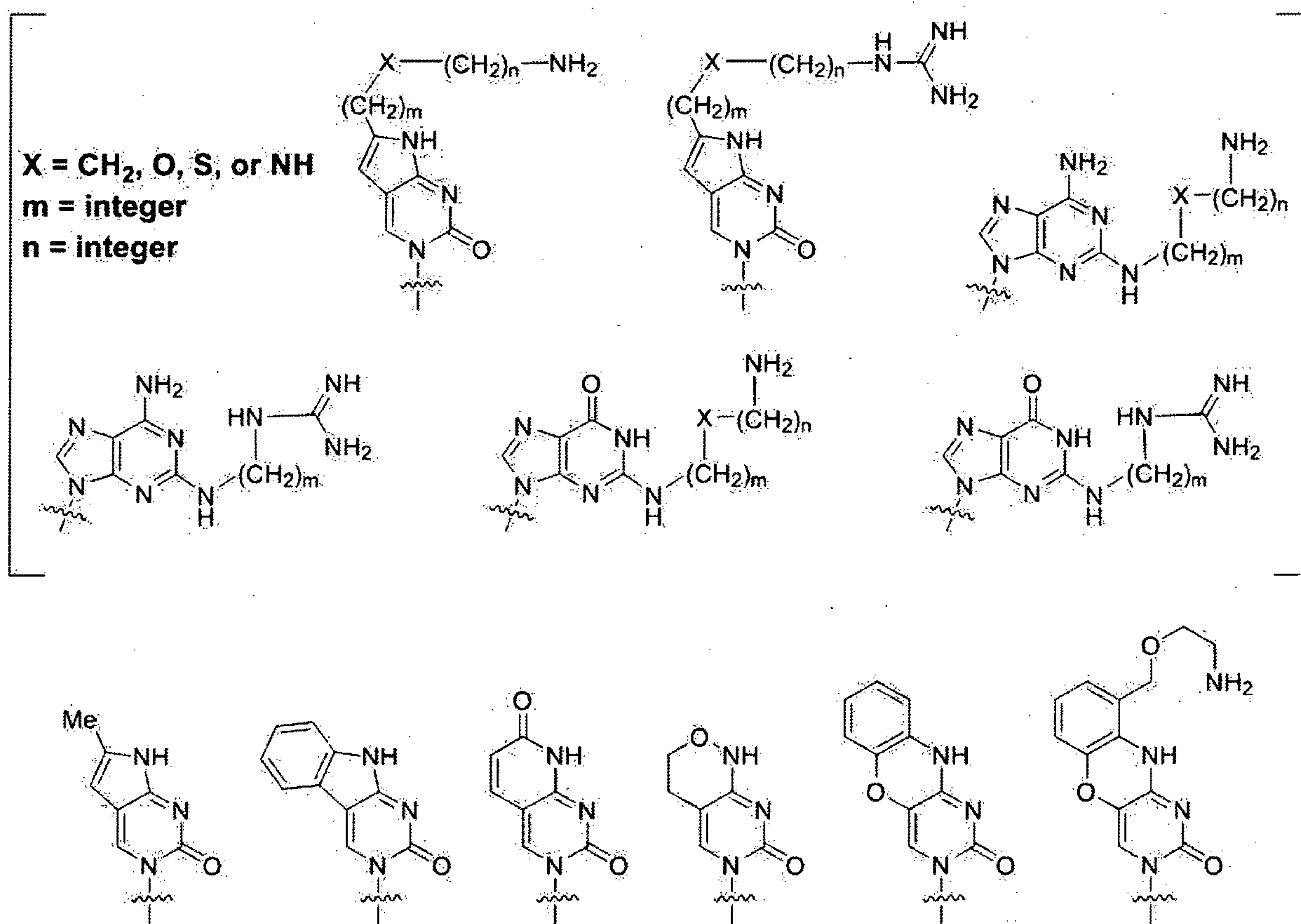


Fig. 1c



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Fig. 2a

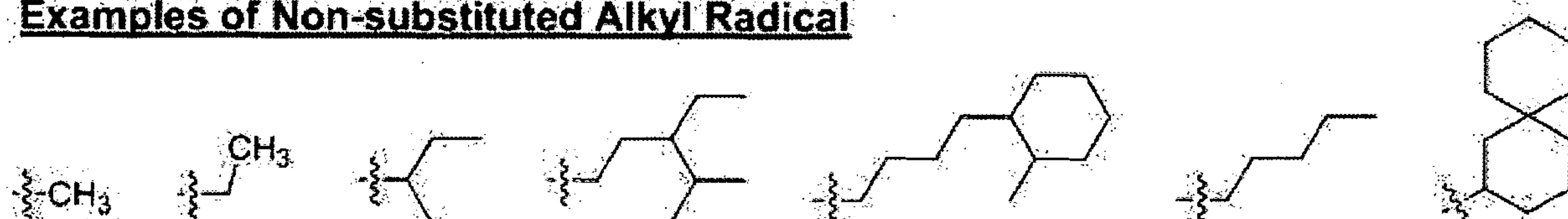
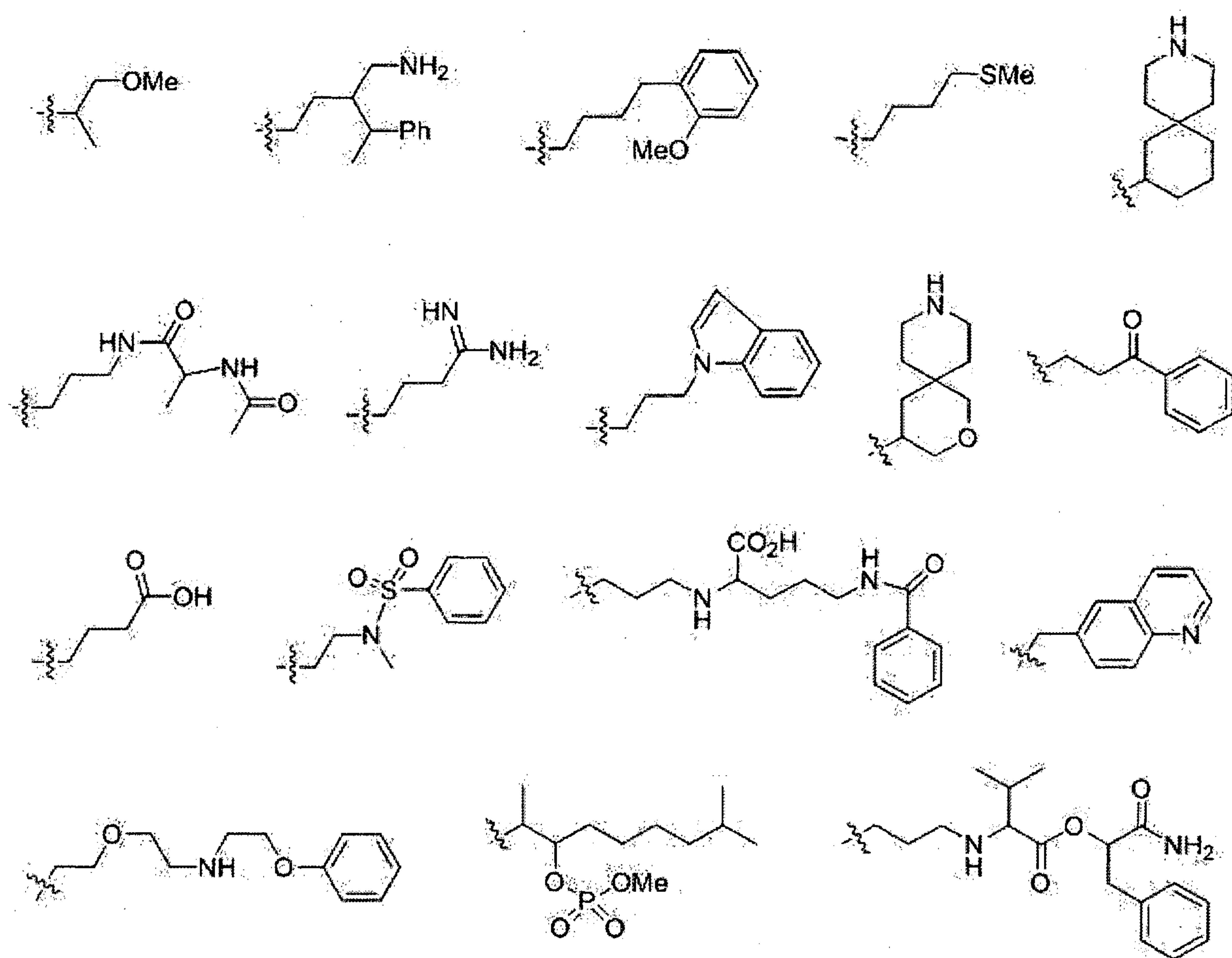
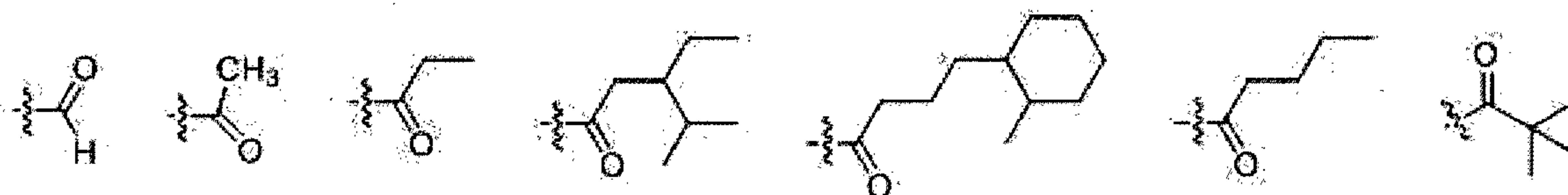
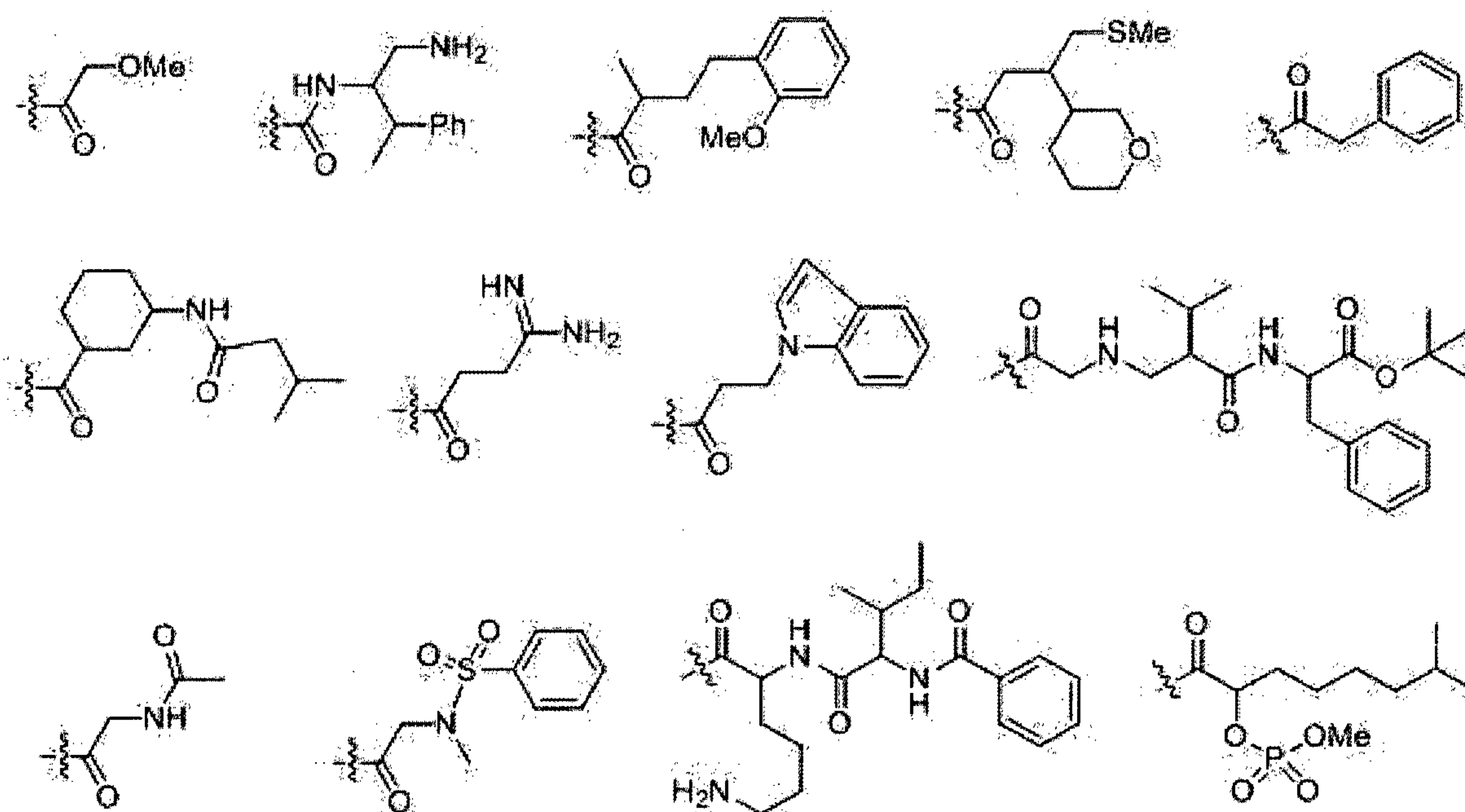
Examples of Non-substituted Alkyl Radical**Examples of Substituted Alkyl Radical**

Fig. 2b

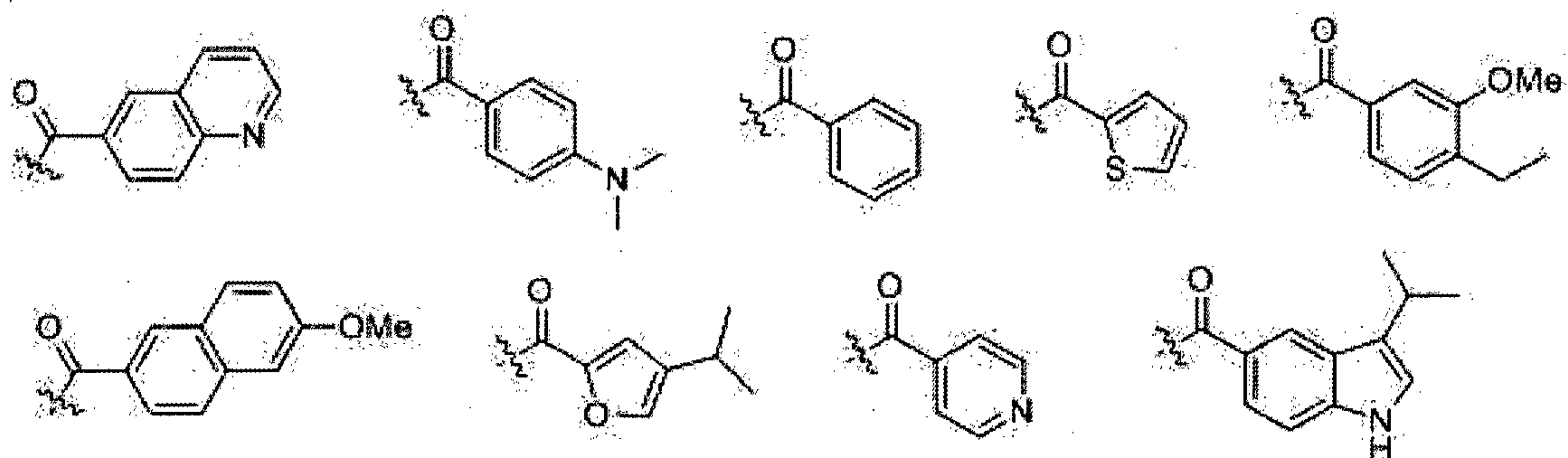
Examples of Non-substituted Alkylacyl Radical



Examples of Substituted Alkylacyl Radical

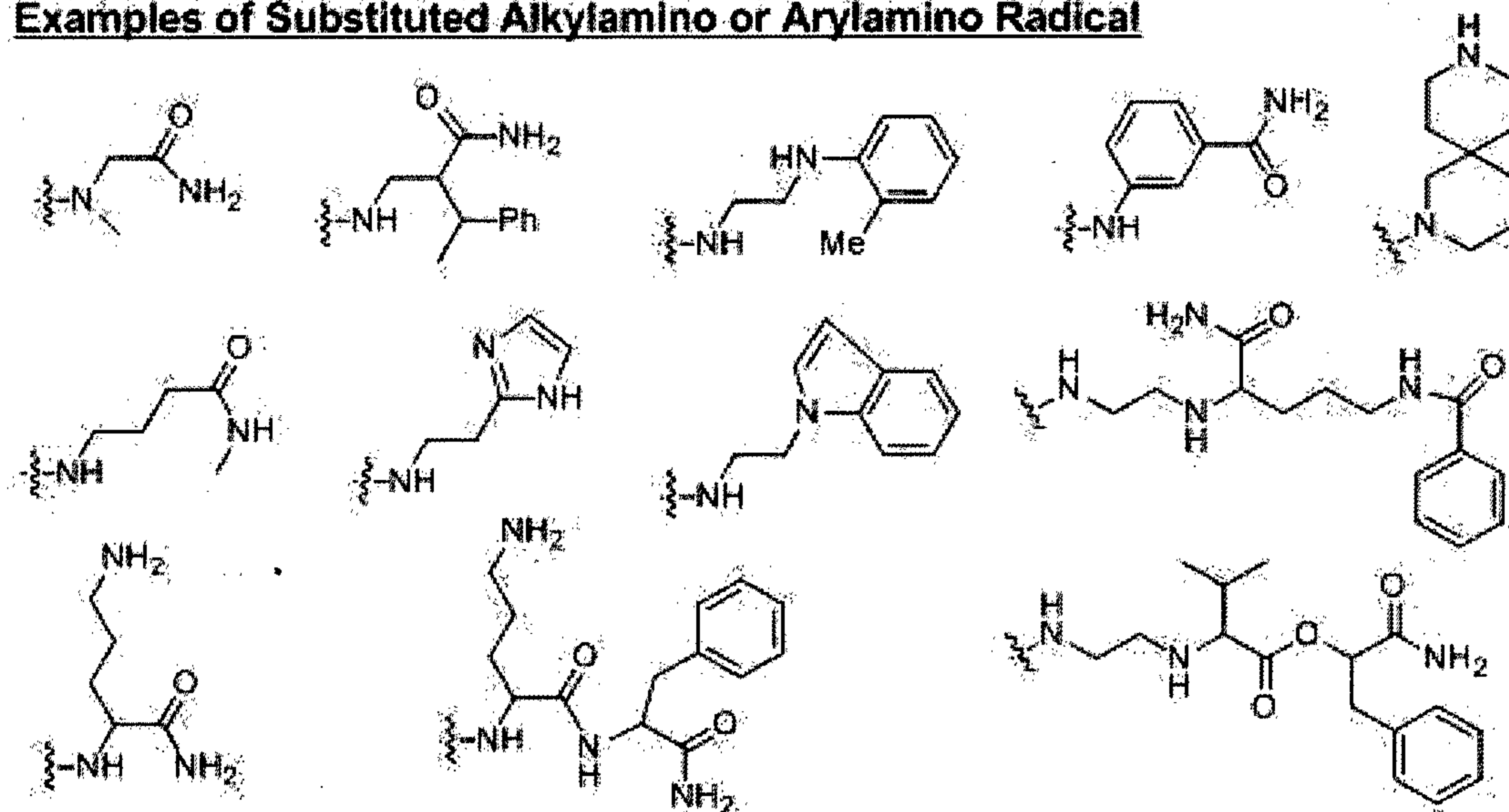
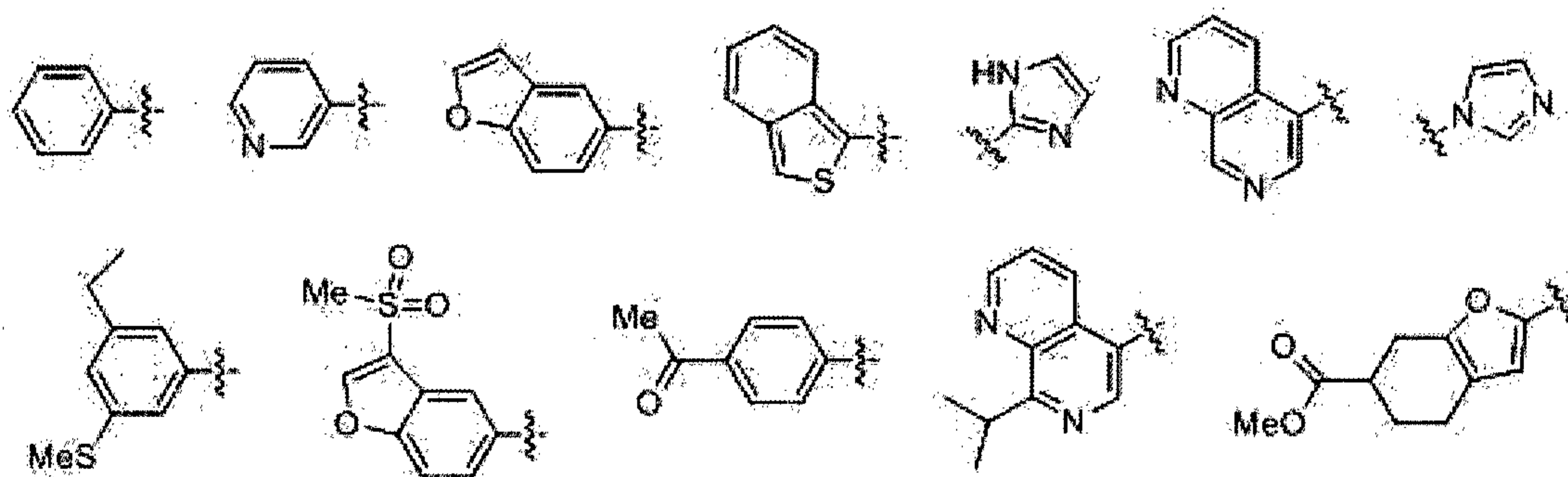
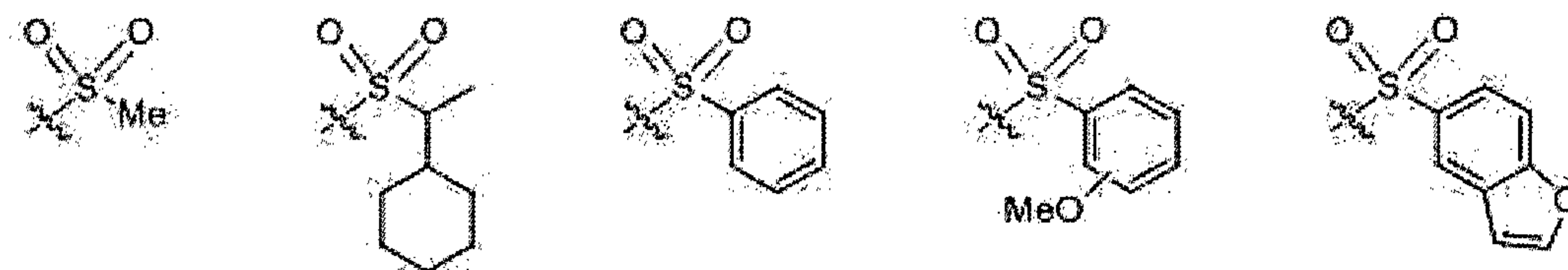
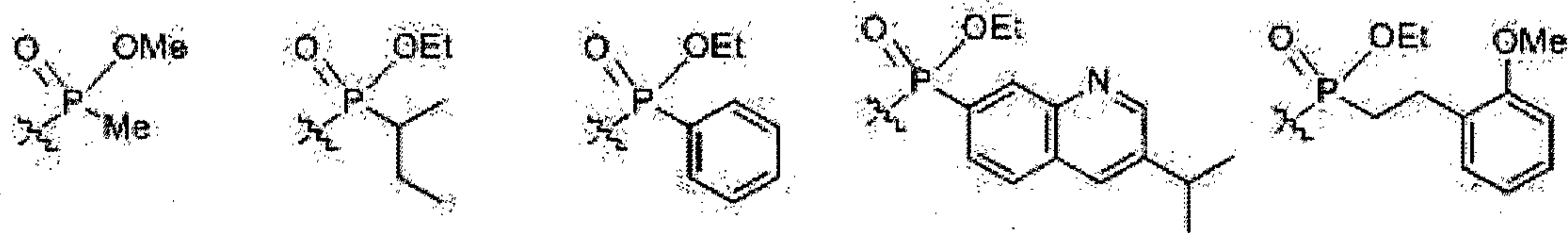


Examples of Substituted or Non-substituted Arylacyl Radical

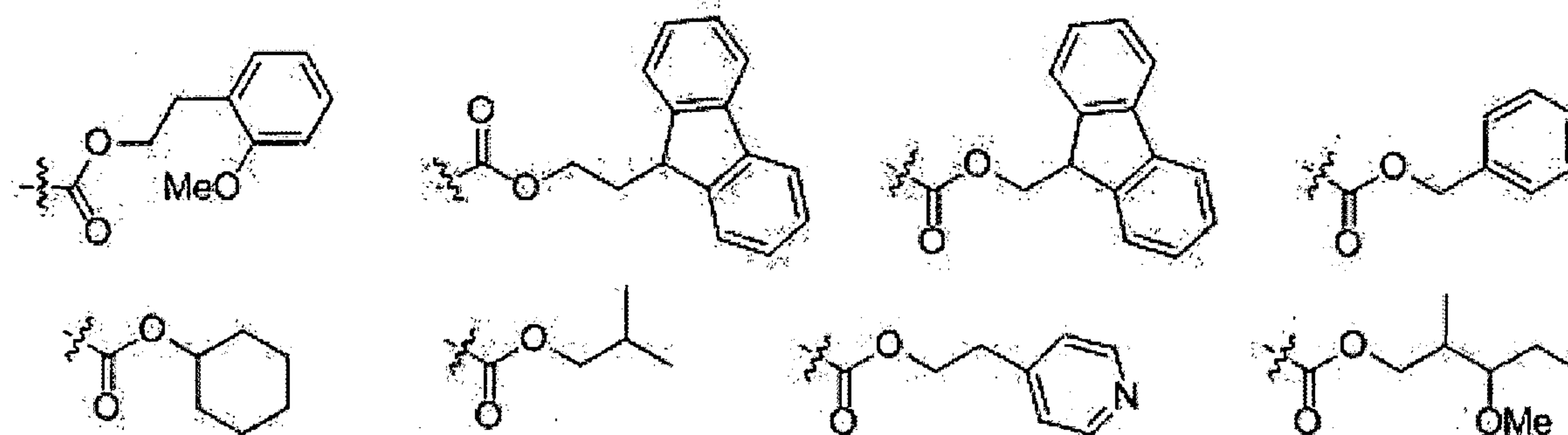
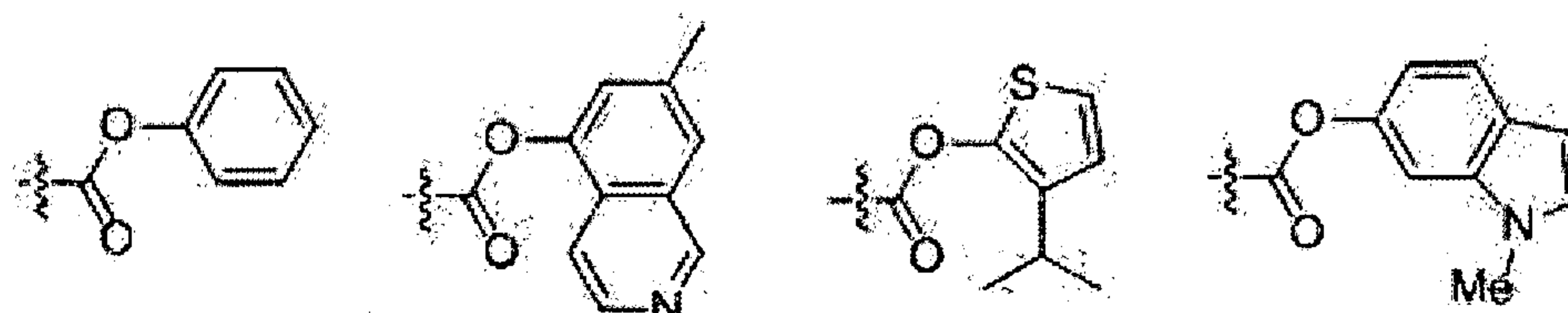
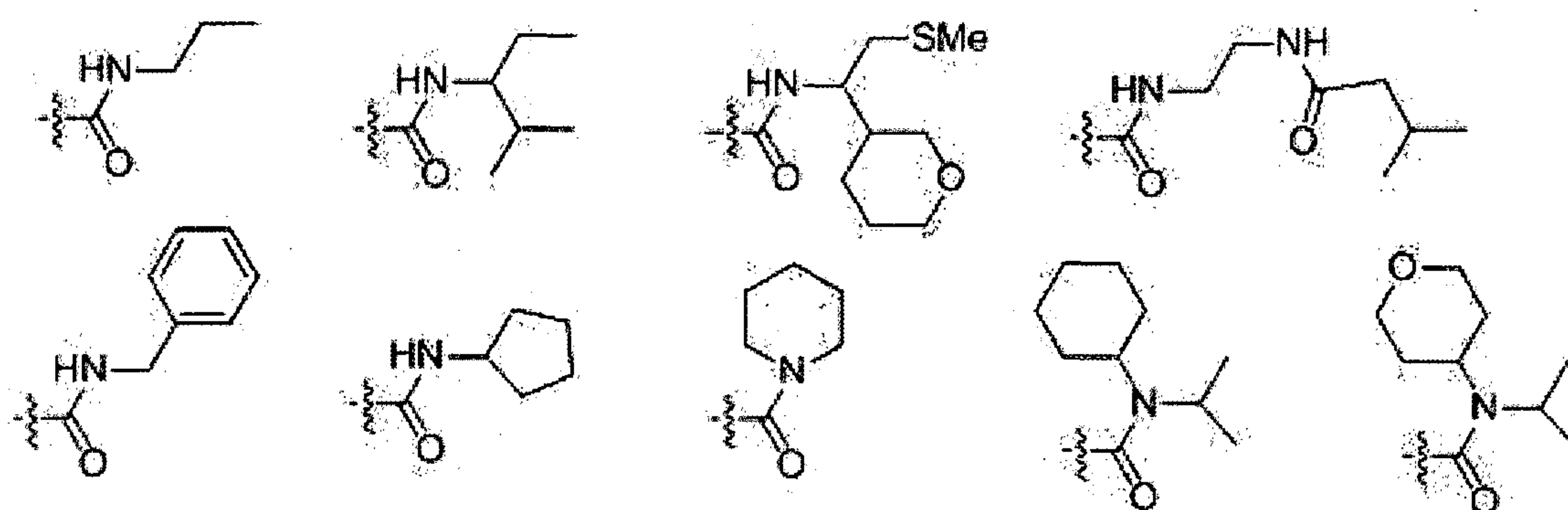
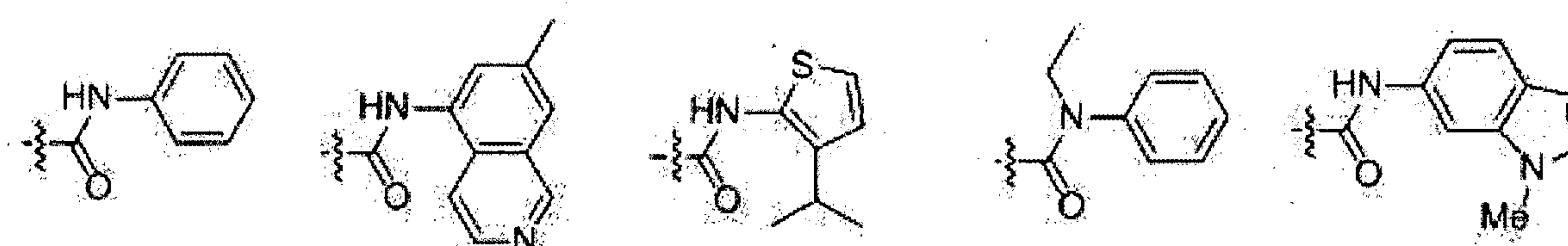


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Fig. 2c

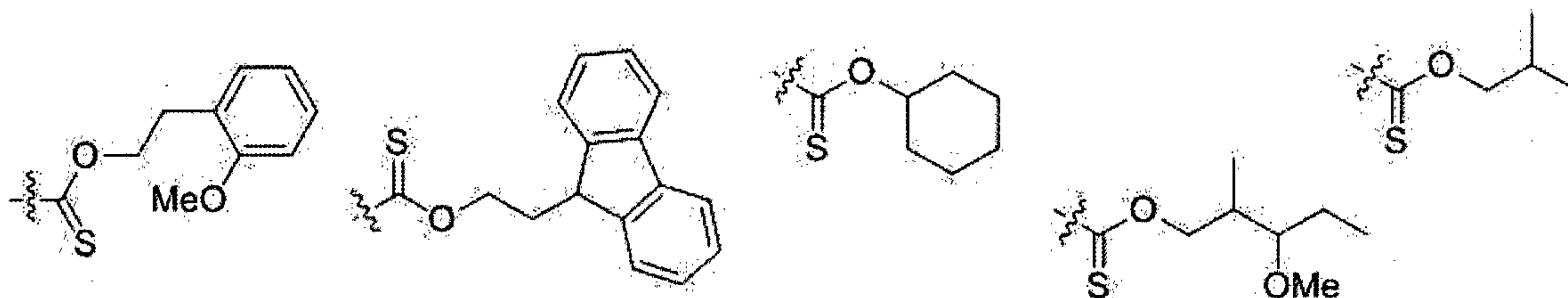
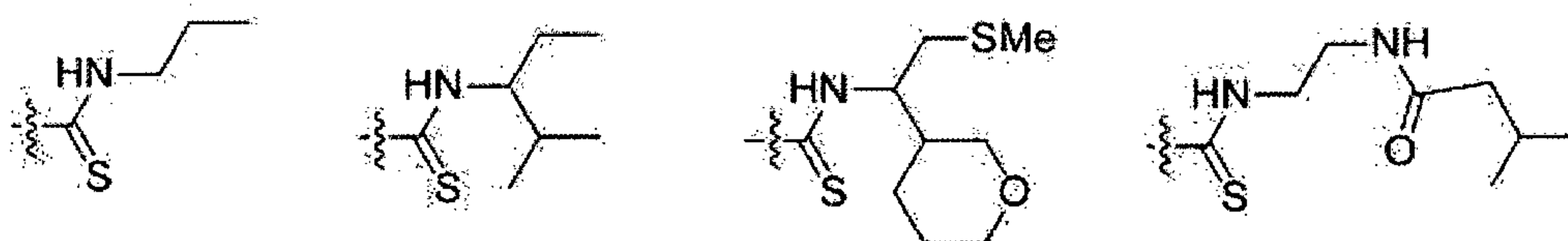
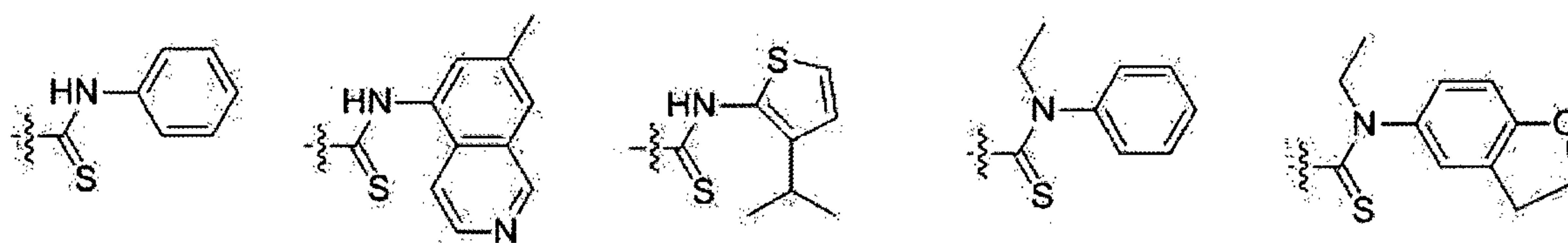
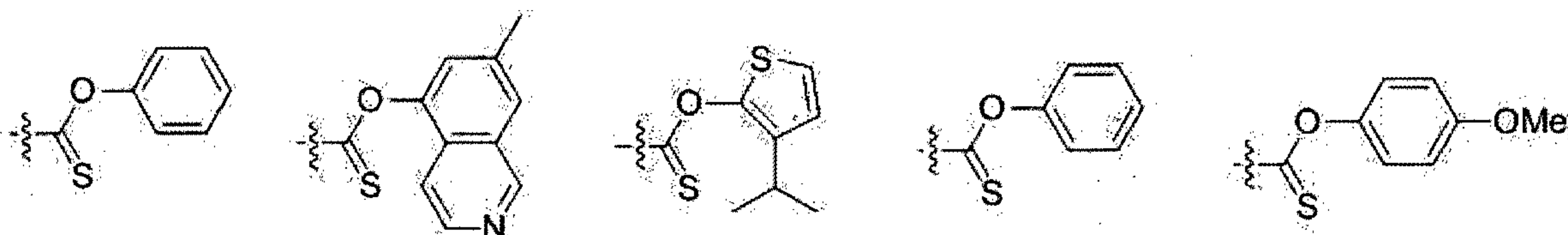
Examples of Substituted Alkylamino or Arylamino Radical**Examples of Substituted or Non-substituted Aryl Radical****Examples of Substituted or Non-substituted Alkylsulfonyl or Arylsulfonyl Radical****Examples of Substituted or Non-substituted Alkyl- or Aryl-phosphonyl Radical**

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Fig. 2d**Examples of Substituted or Non-substituted Alkyloxycarbonyl Radical****Examples of Substituted or Non-substituted Aryloxycarbonyl Radical****Examples of Substituted or Non-substituted Alkylaminocarbonyl Radical****Examples of Substituted or Non-substituted Arylaminocarbonyl Radical**

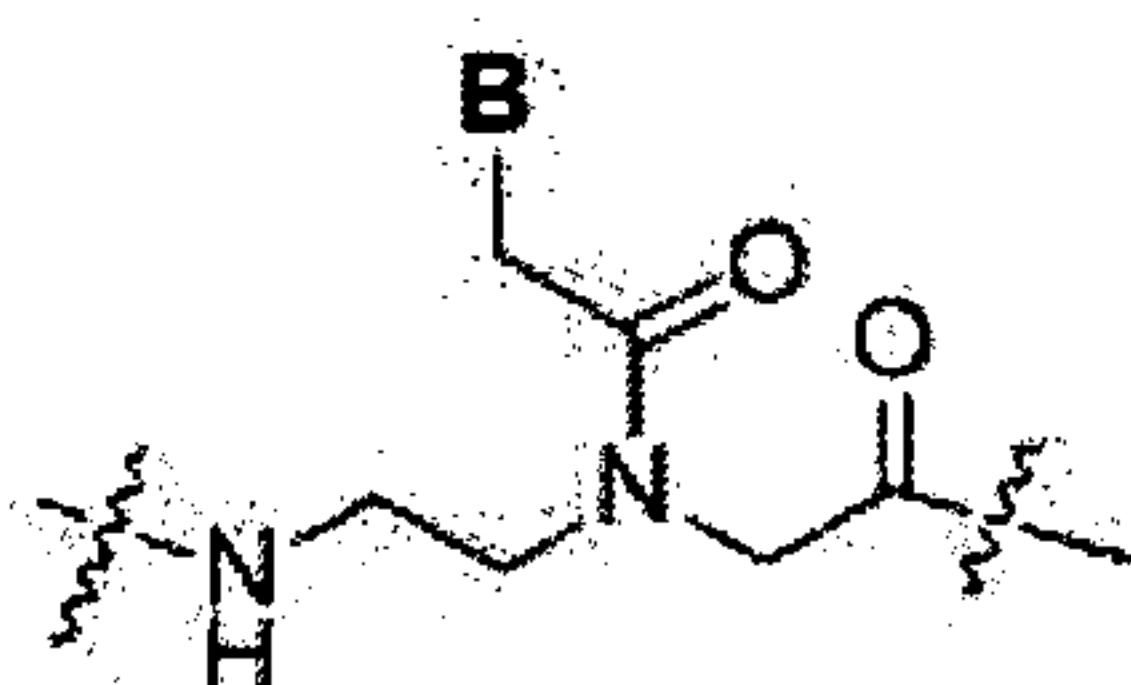
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Fig. 2e

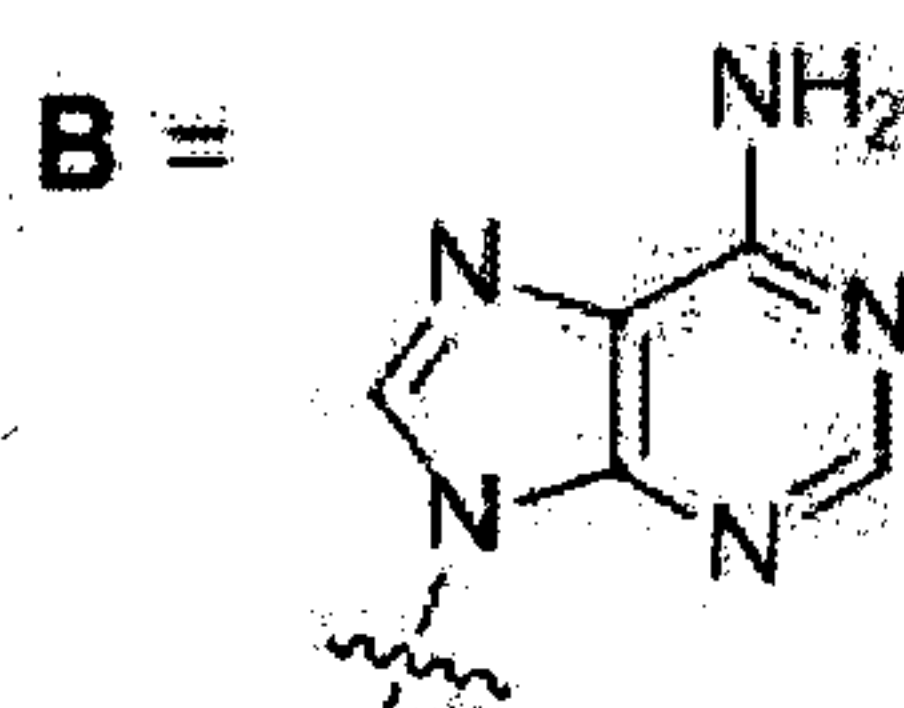
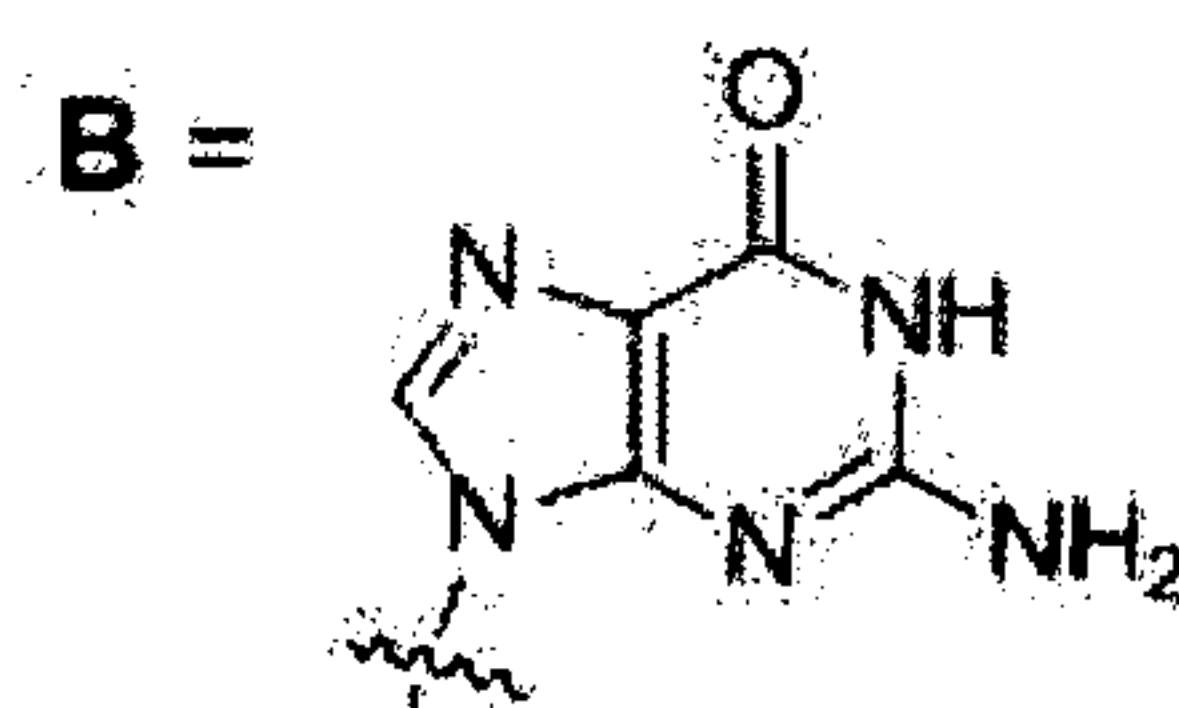
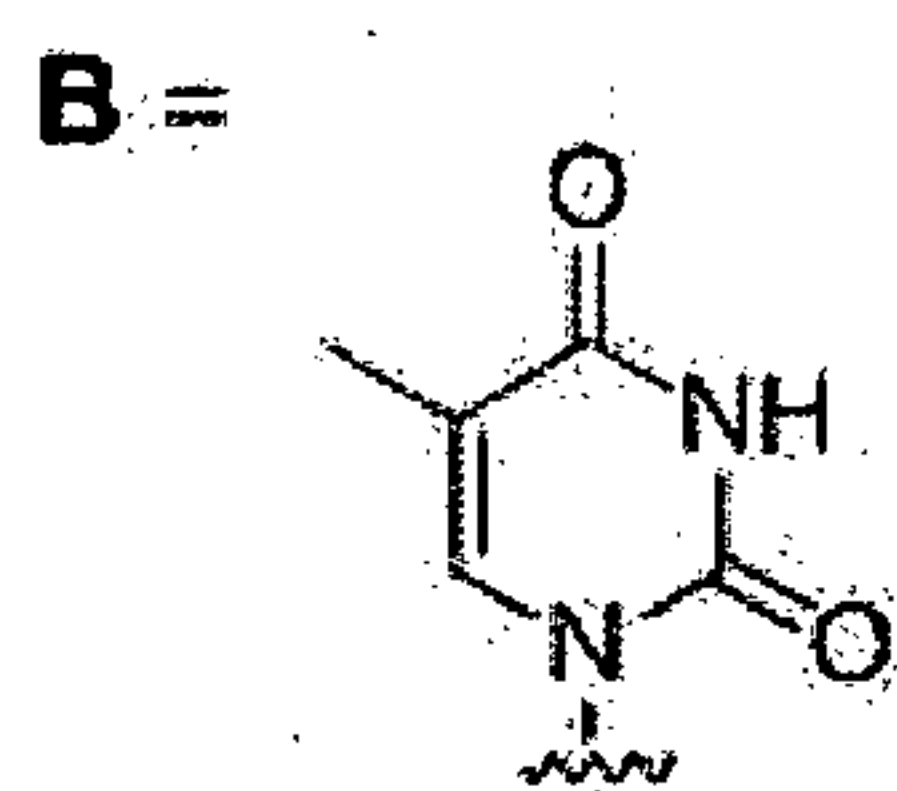
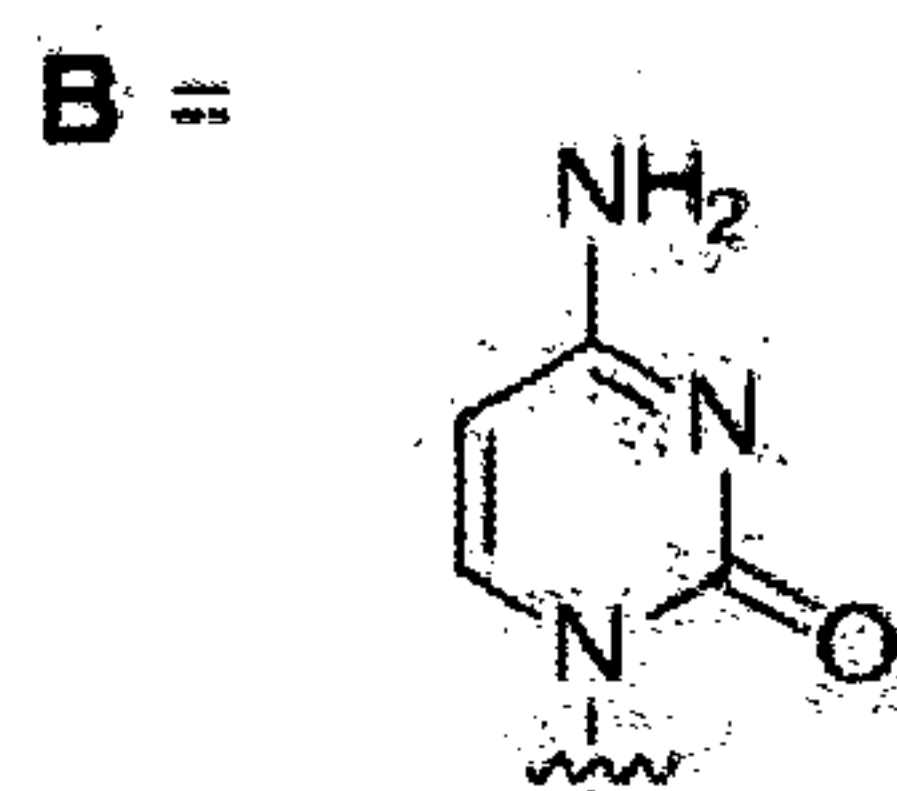
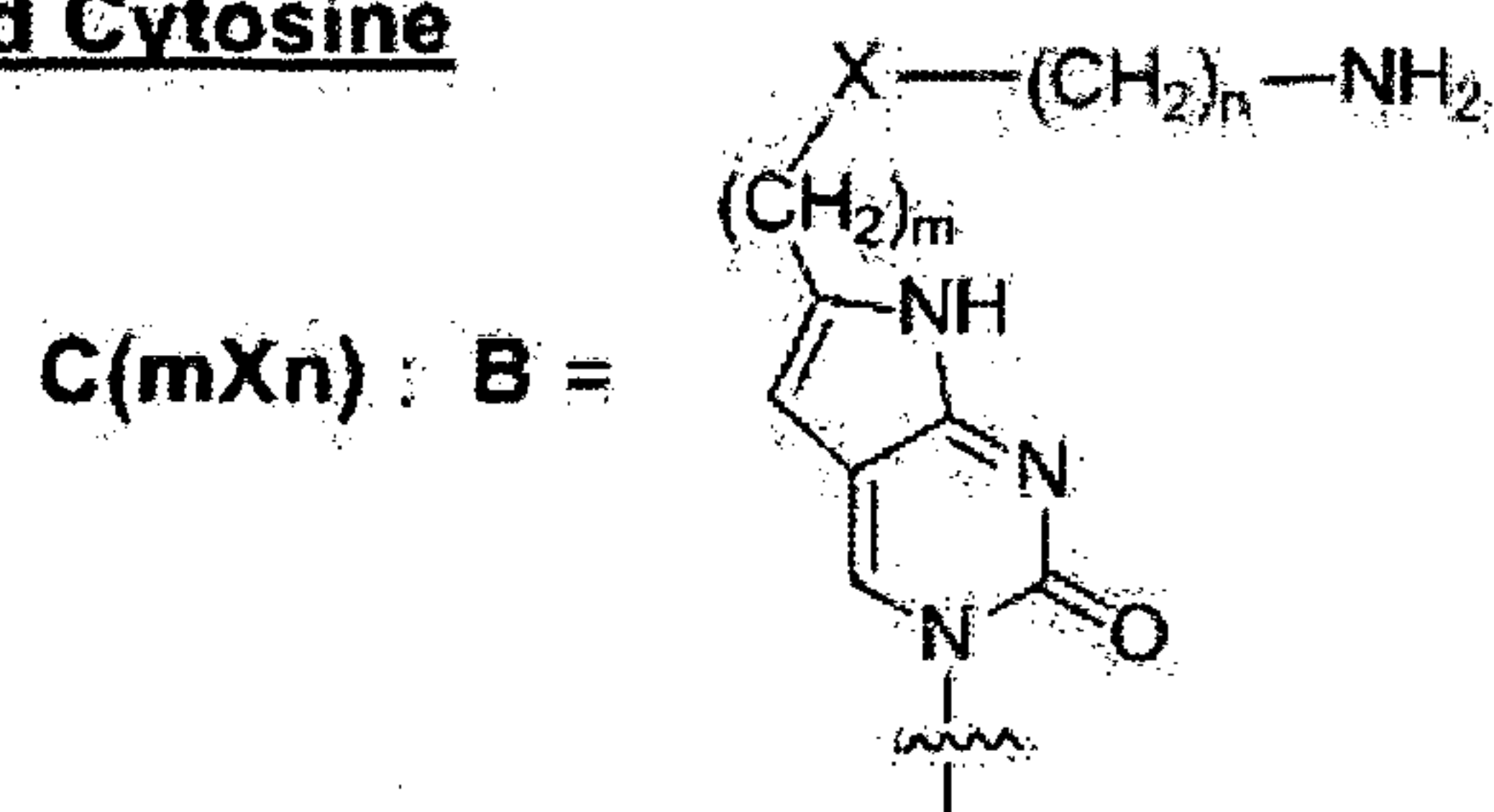
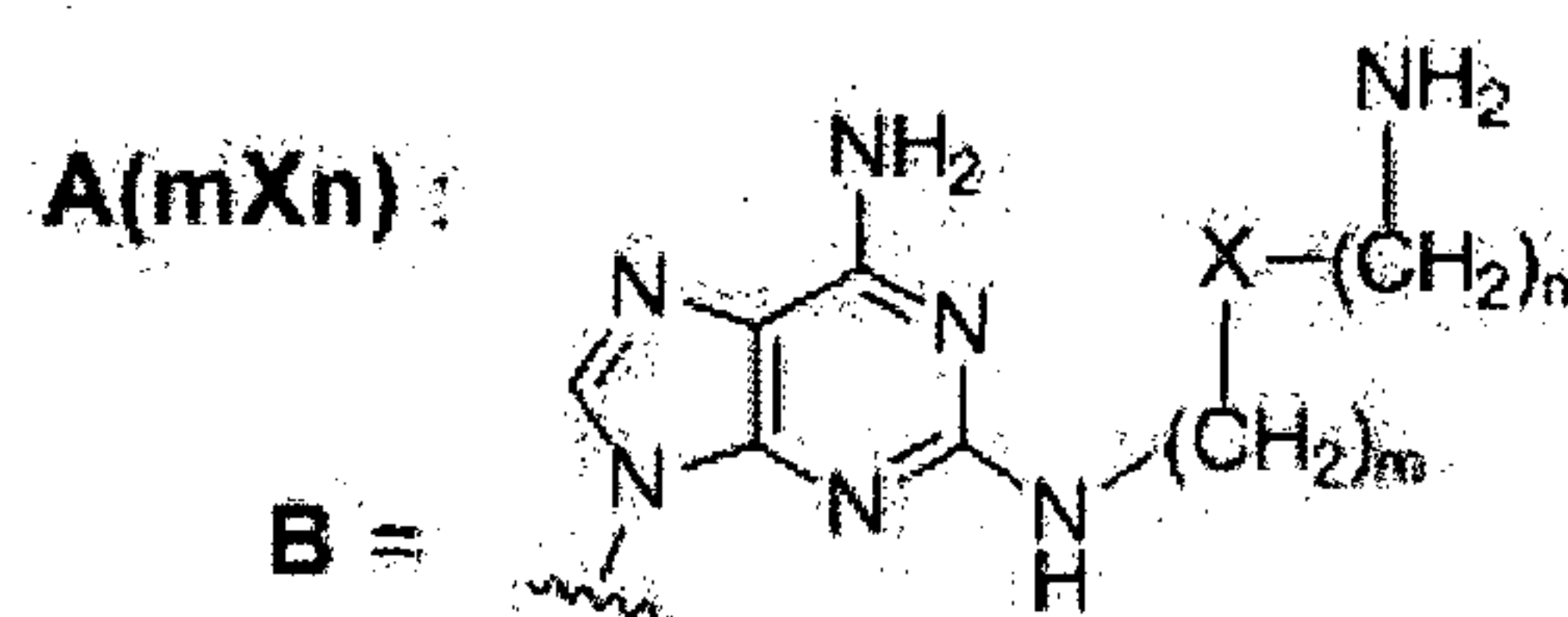
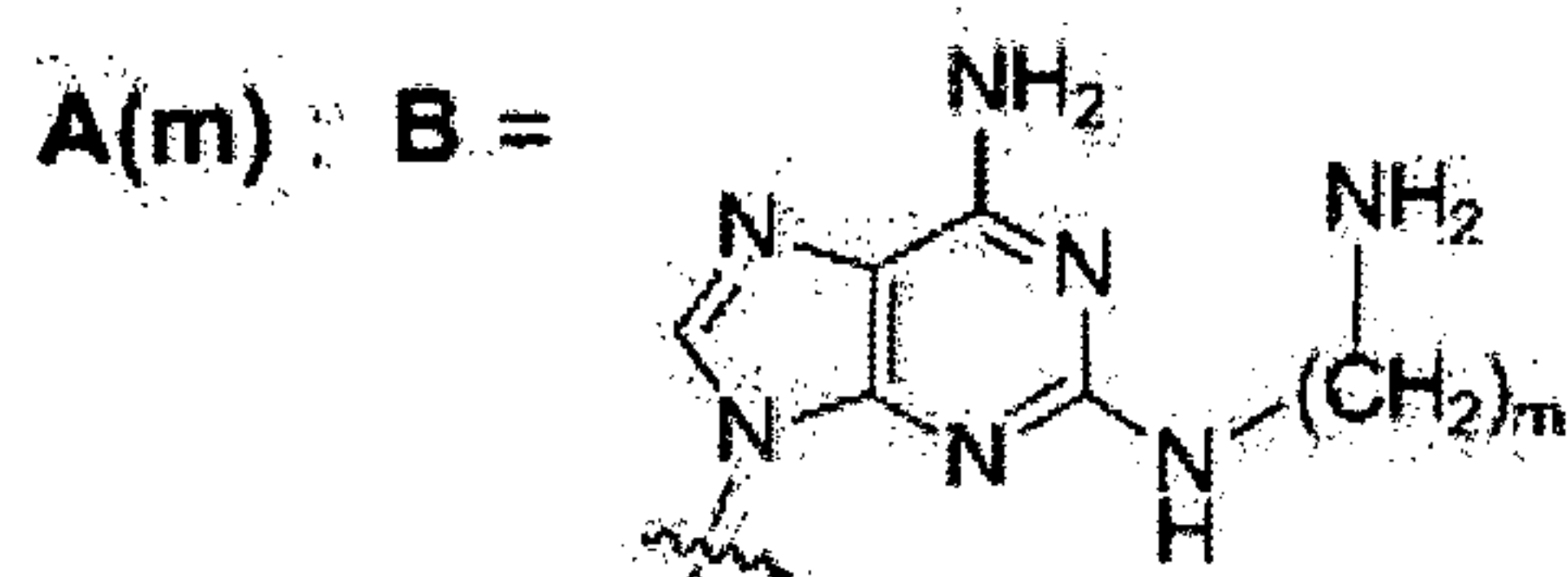
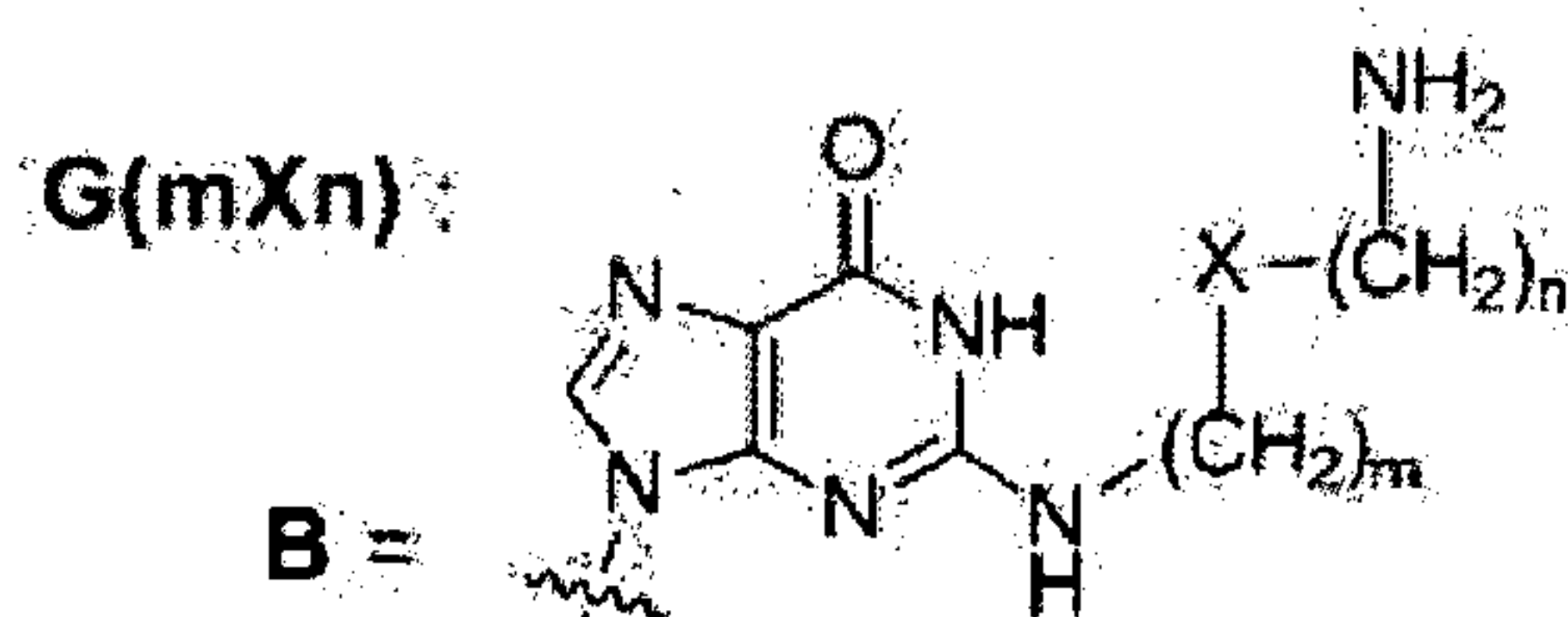
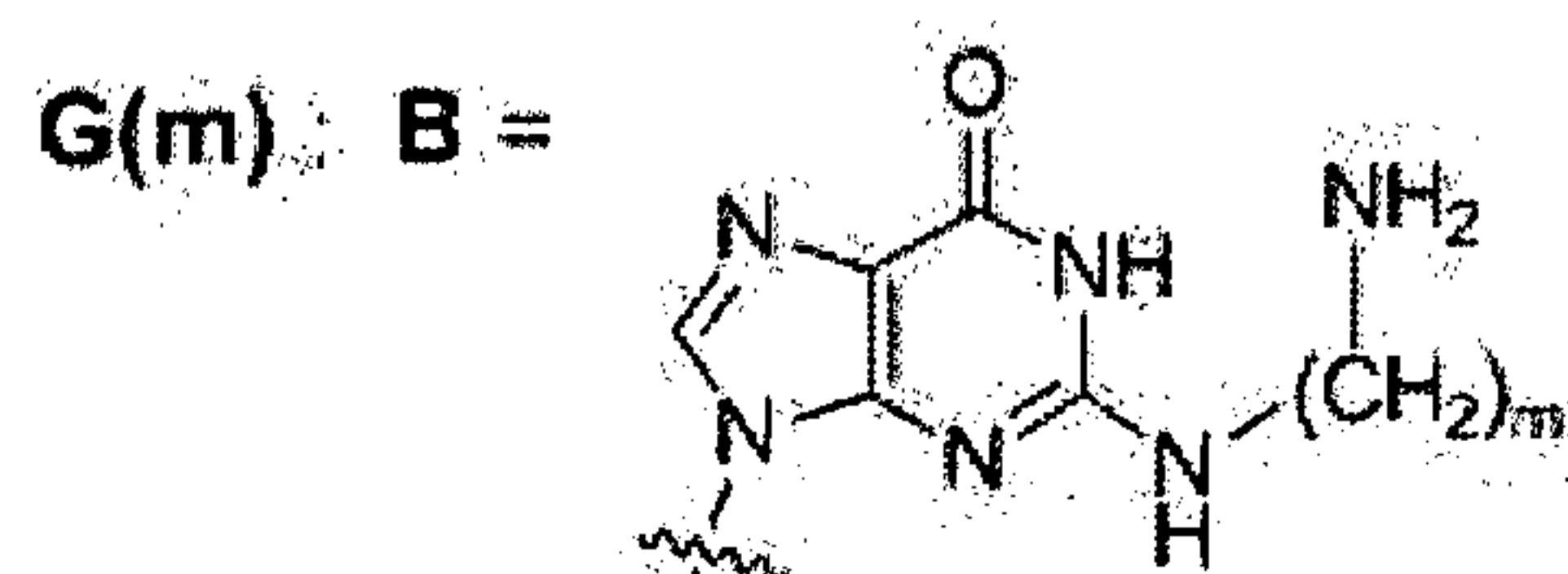
Examples of Substituted or Non-substituted Alkyloxythiocarbonyl Radical**Examples of Substituted or Non-substituted Alkylaminothiocarbonyl Radical****Examples of Substituted or Non-substituted Arylaminothiocarbonyl Radical****Examples of Substituted or Non-substituted Aryloxythiocarbonyl Radical**

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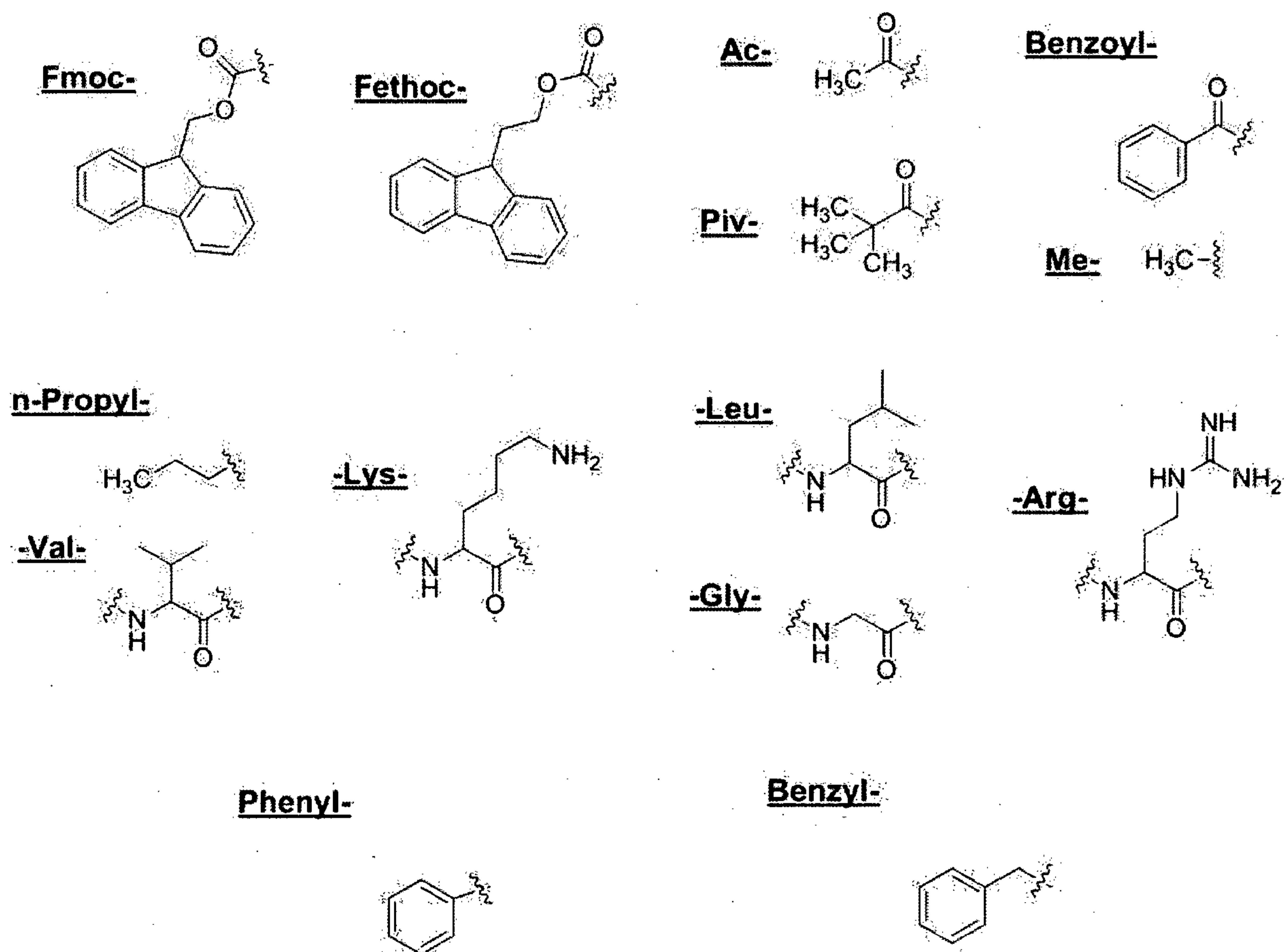
Fig. 3

PNA Monomer

B : Nucleobase
X : O (oxygen atom)
m : Integer
n : Integer

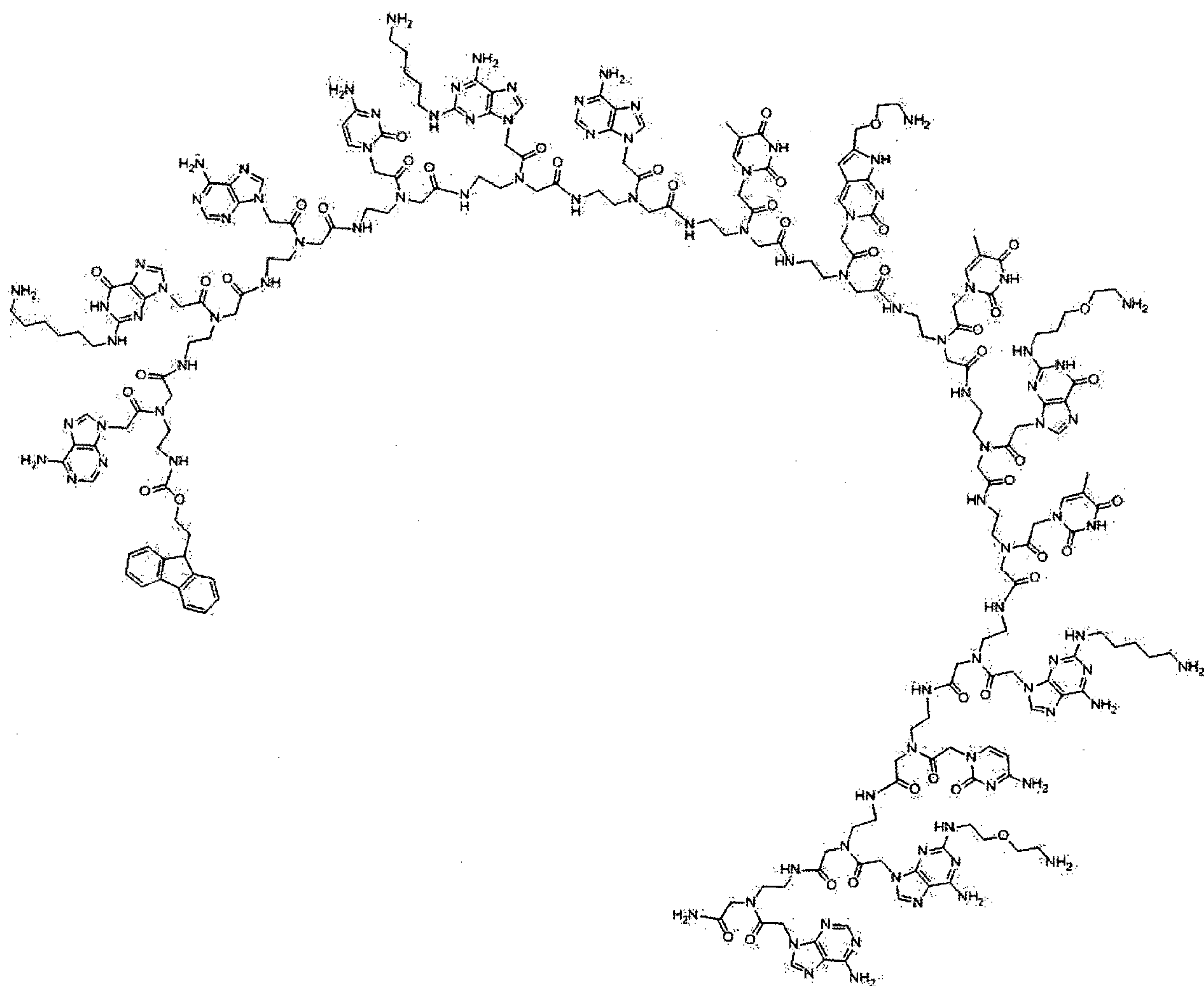
AdenineGuanineThymineCytosineModified CytosineModified AdenineModified Guanine

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Fig. 4**Chemical Structures for Abbreviations for N- or C-terminus Substituents**

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Fig. 5b



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Fig. 6

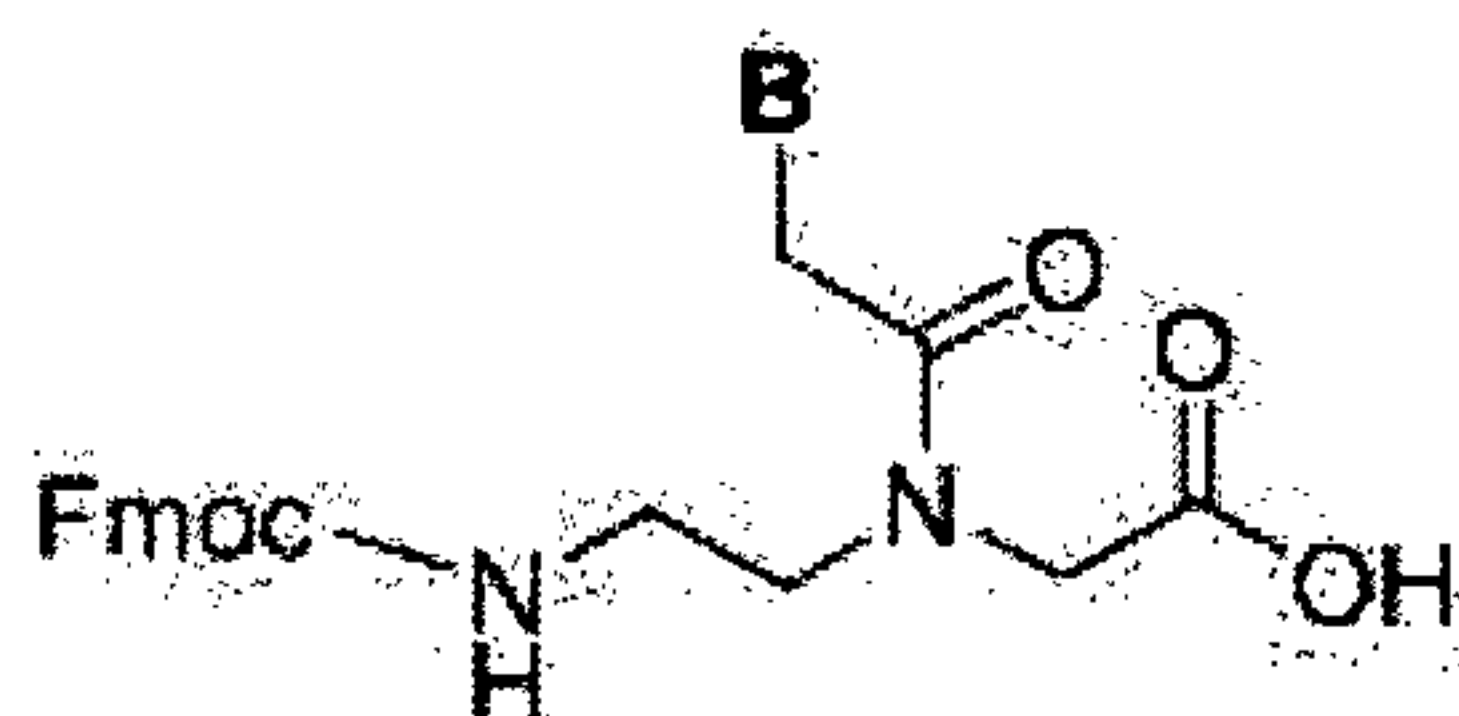
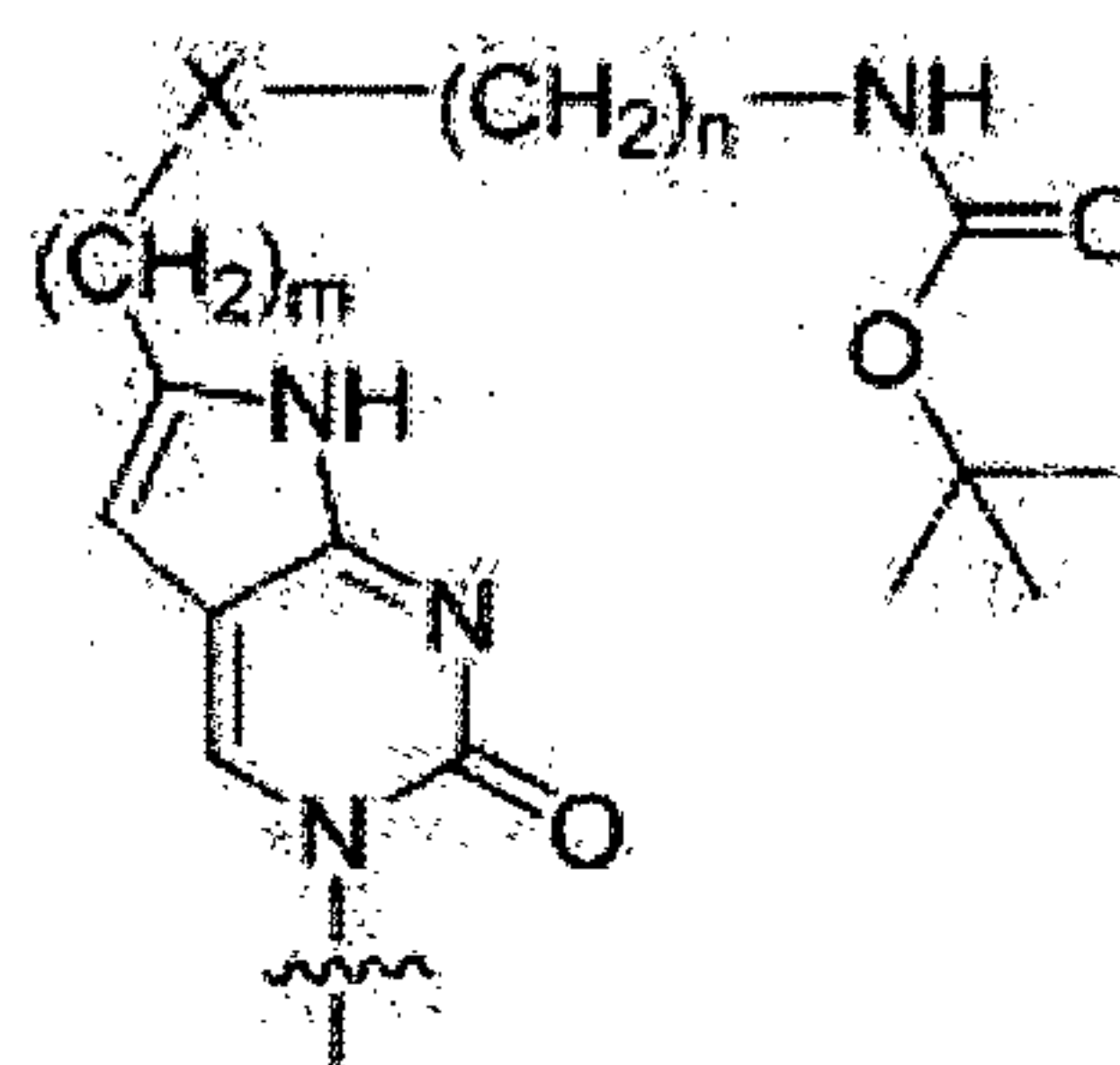
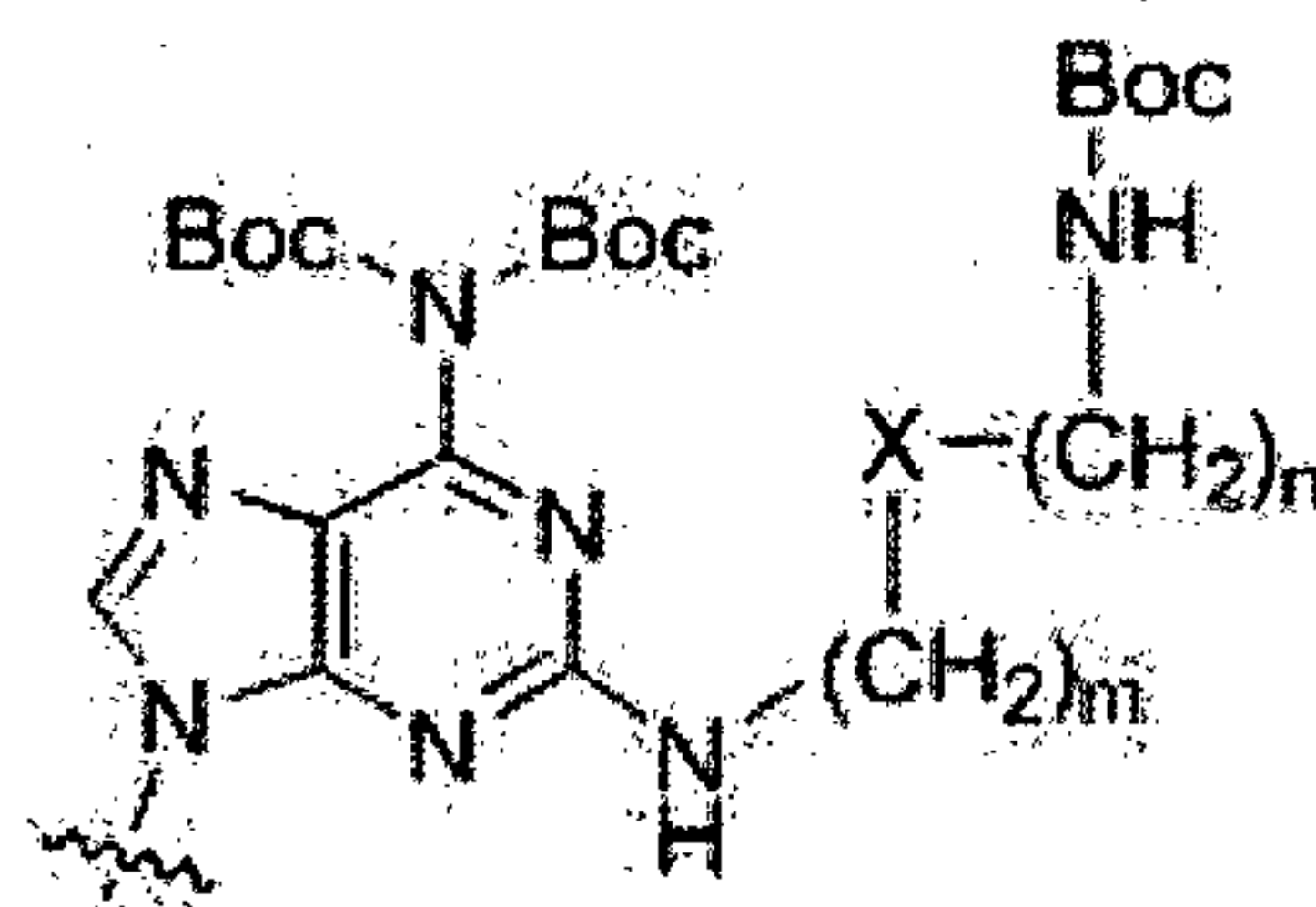
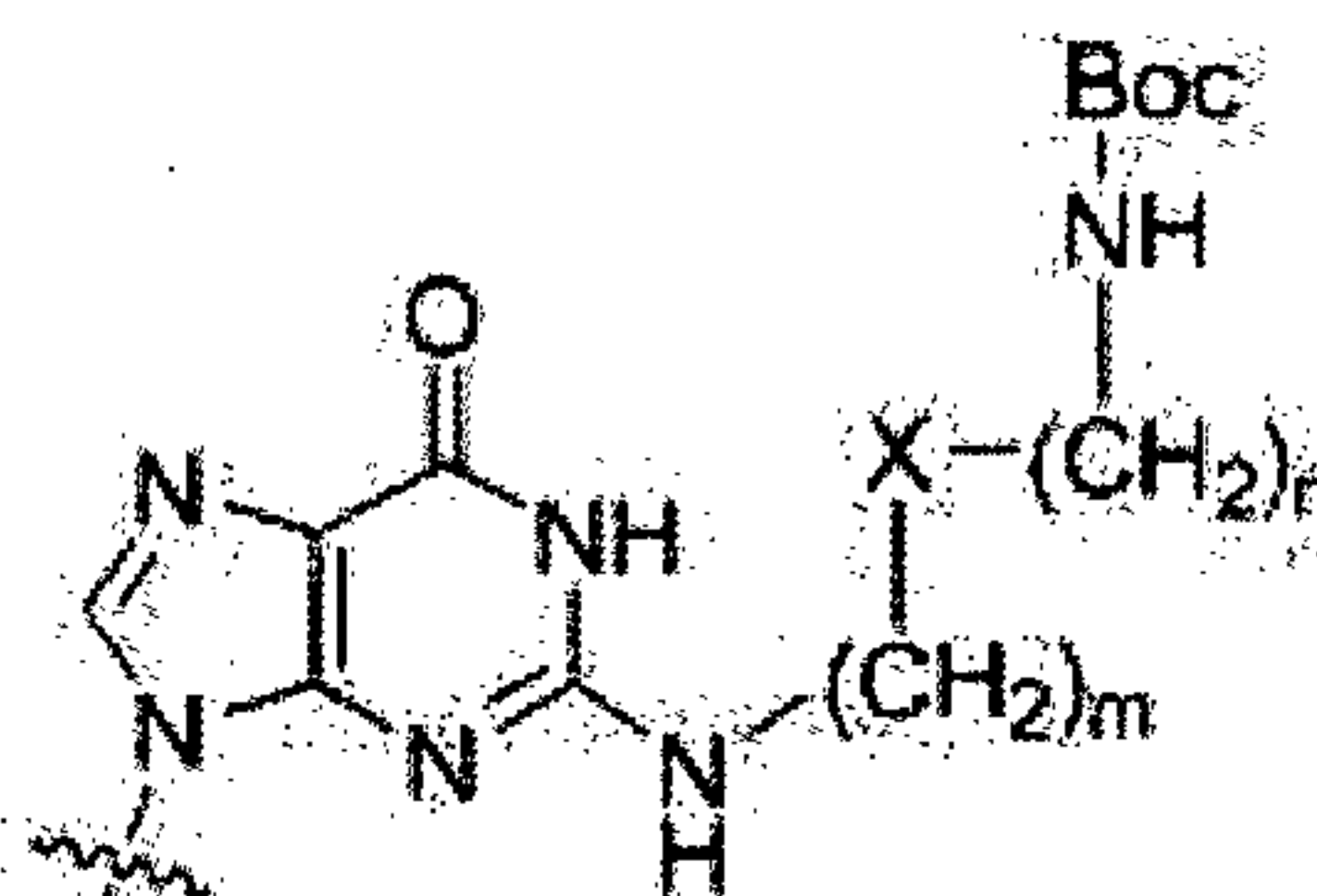
Fmoc-PNA Monomer**B** : Nucleobase with protecting group(s)**X** : methylene, oxygen, sulfur, or Boc-protected amino**m** : Integer**n** : Integer**Modified Cytosine****C(mXn) : B =****Modified Adenine****A(mXn) :****B =****Modified Guanine****G(mXn) :****B =**

Fig. 7a

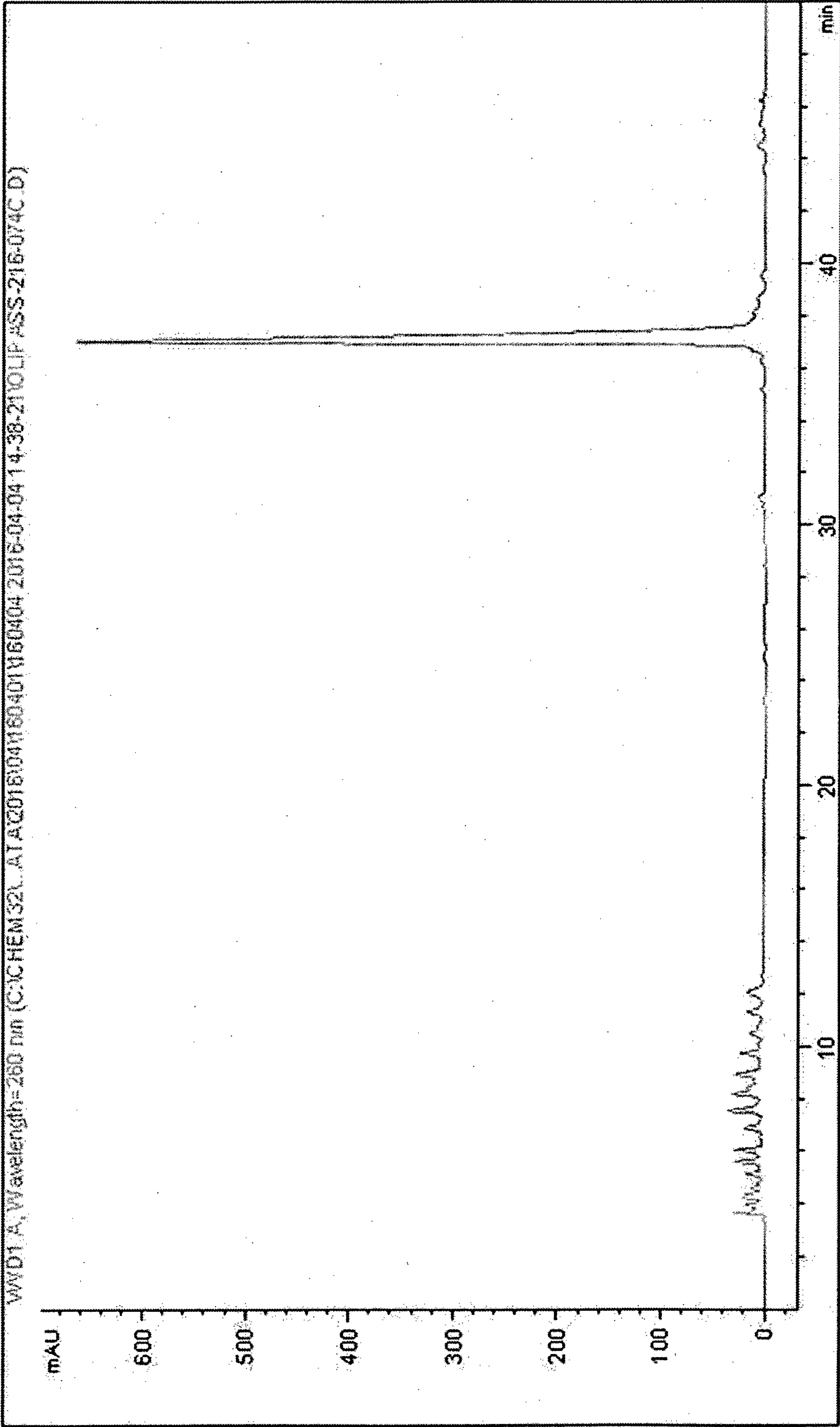


Fig. 7b

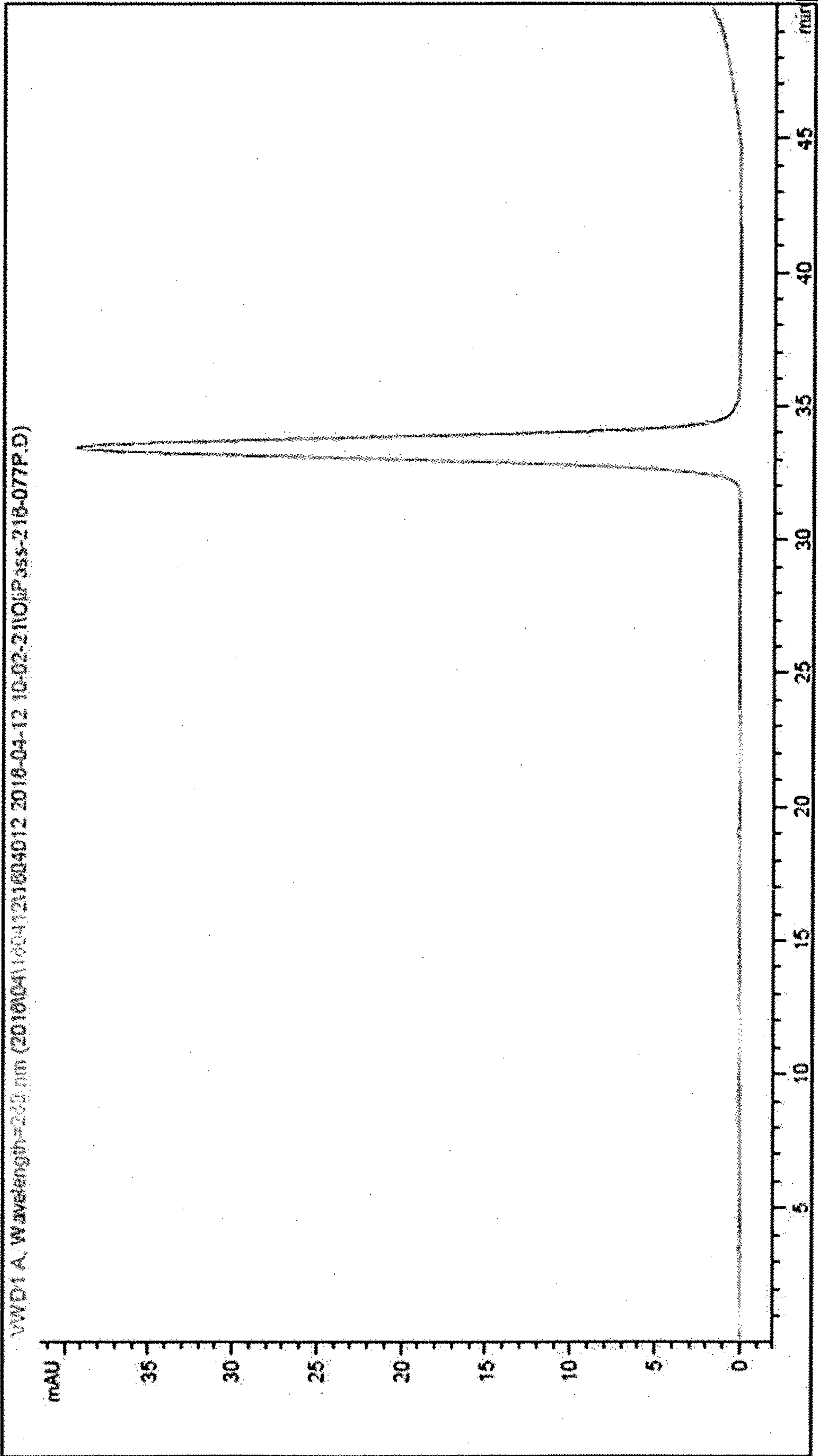


Fig. 8

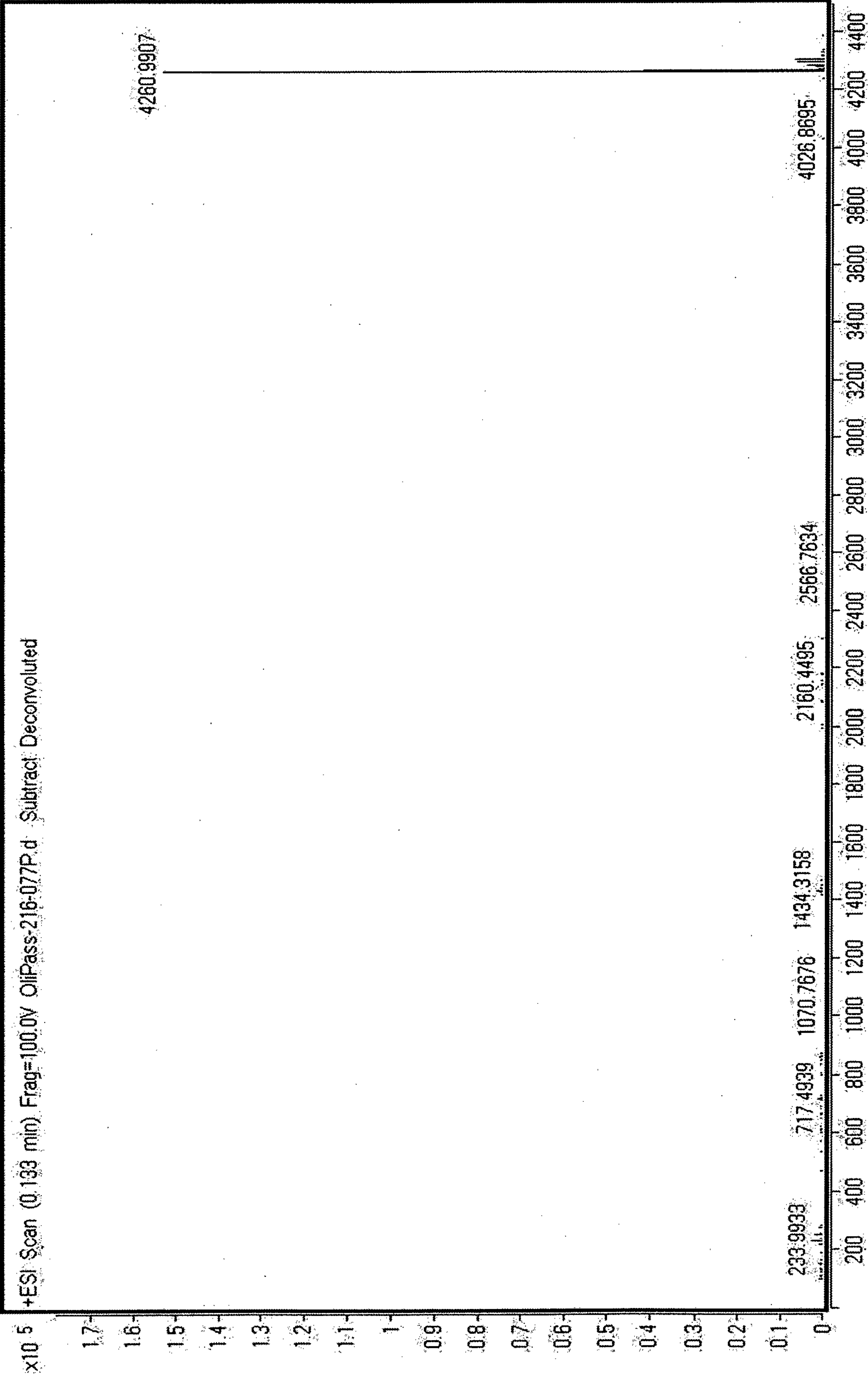


Fig. 9a

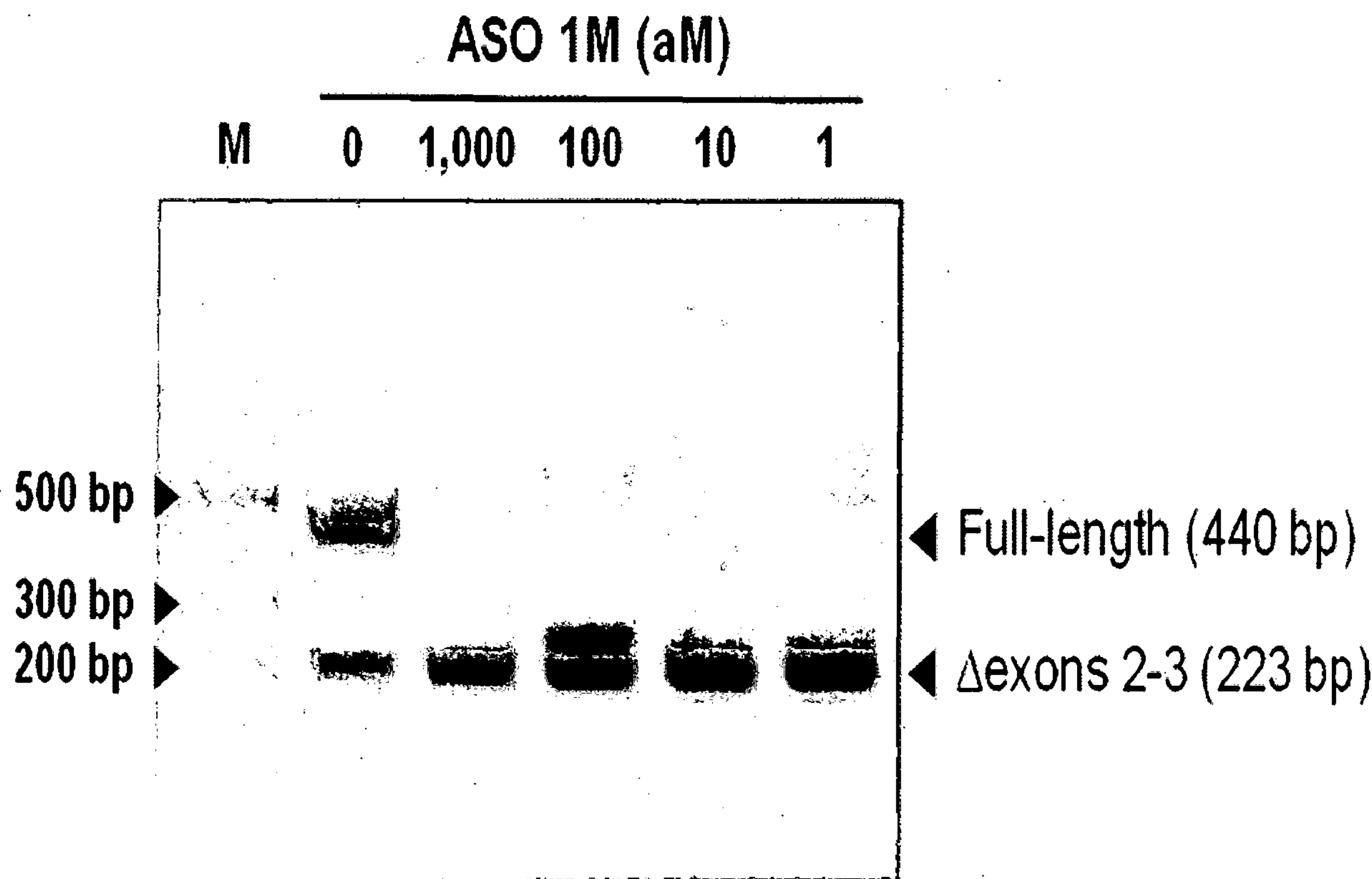
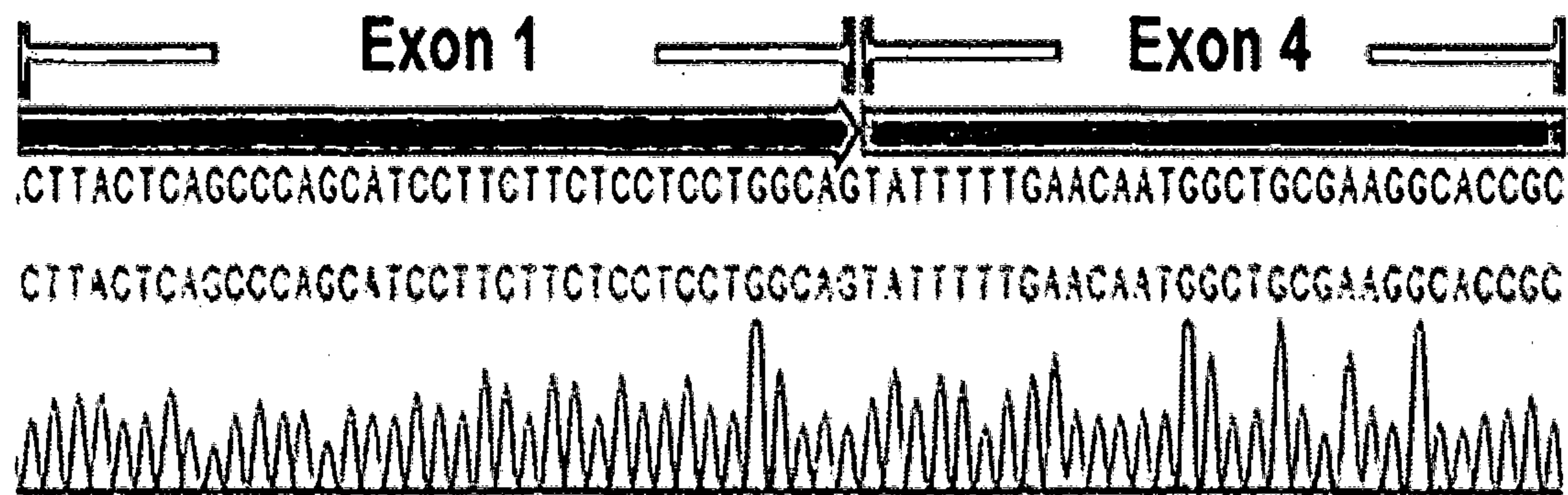


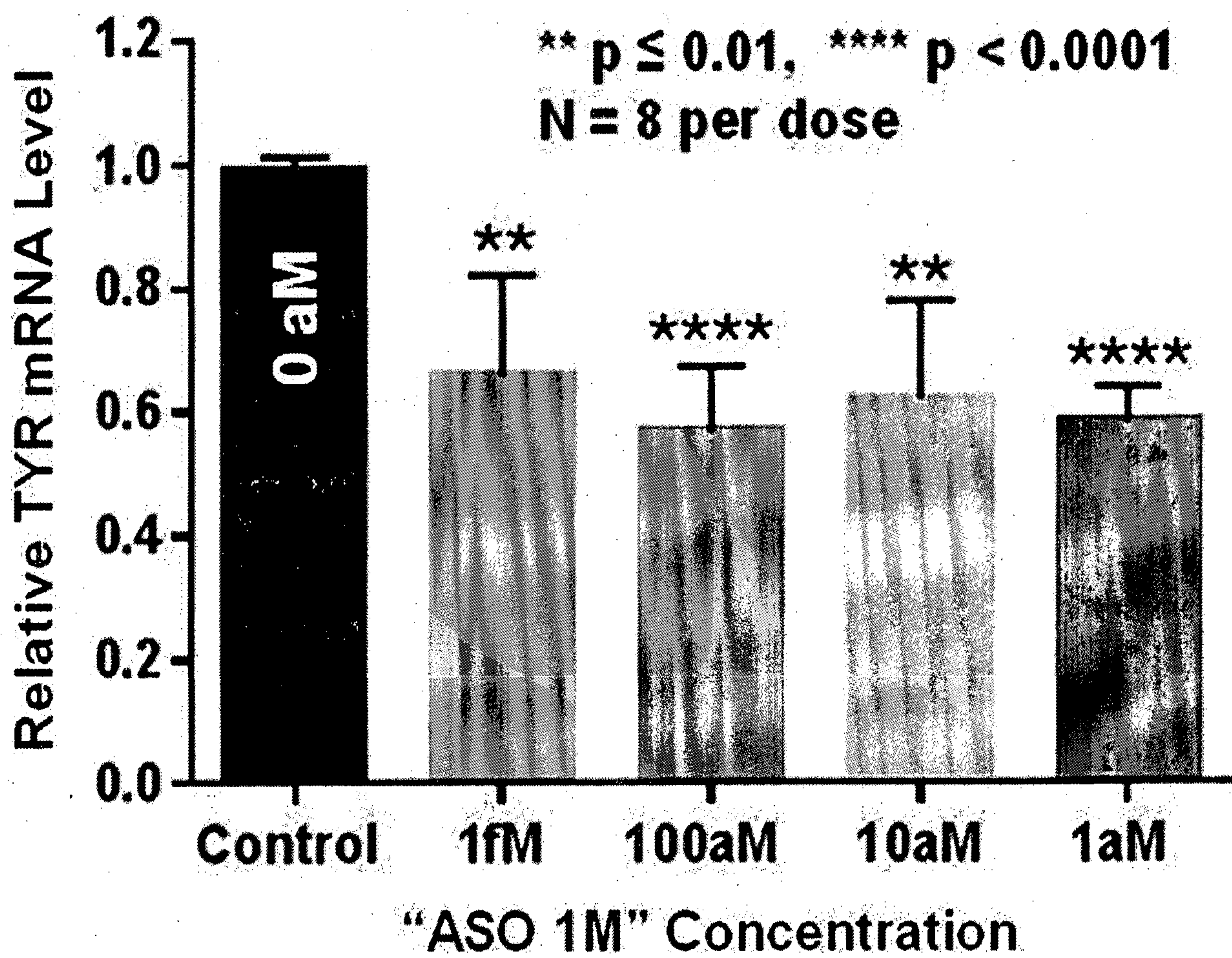
Fig. 9b

152 bp	217 bp	148 bp	71 bp	
Exon 1	Exon 2	Exon 3	Exon 4	440 bp
Exon 1	Exon 2	Exon 3	Exon 4	223 bp



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Fig. 10a



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Fig. 10b

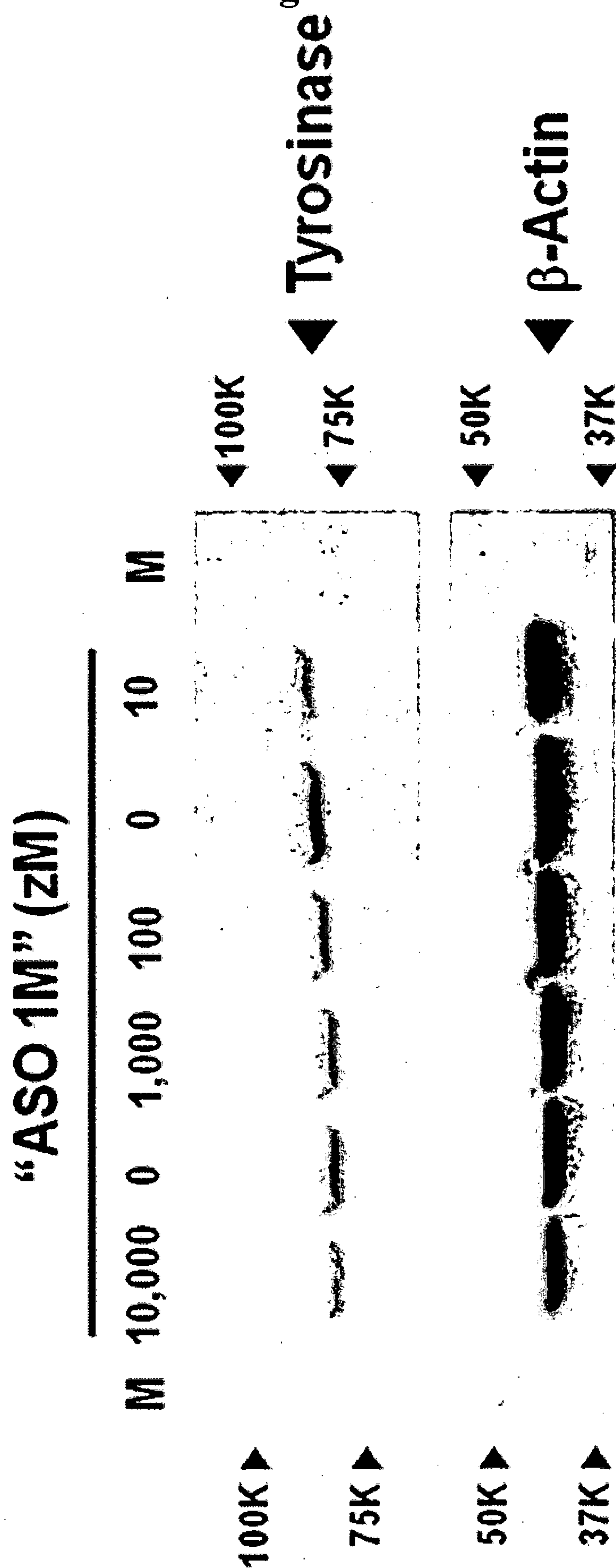


Fig. 11

*** $p \leq 0.05$, ** $p \leq 0.01$, and *** $p \leq 0.001$**
N = 8 per dose

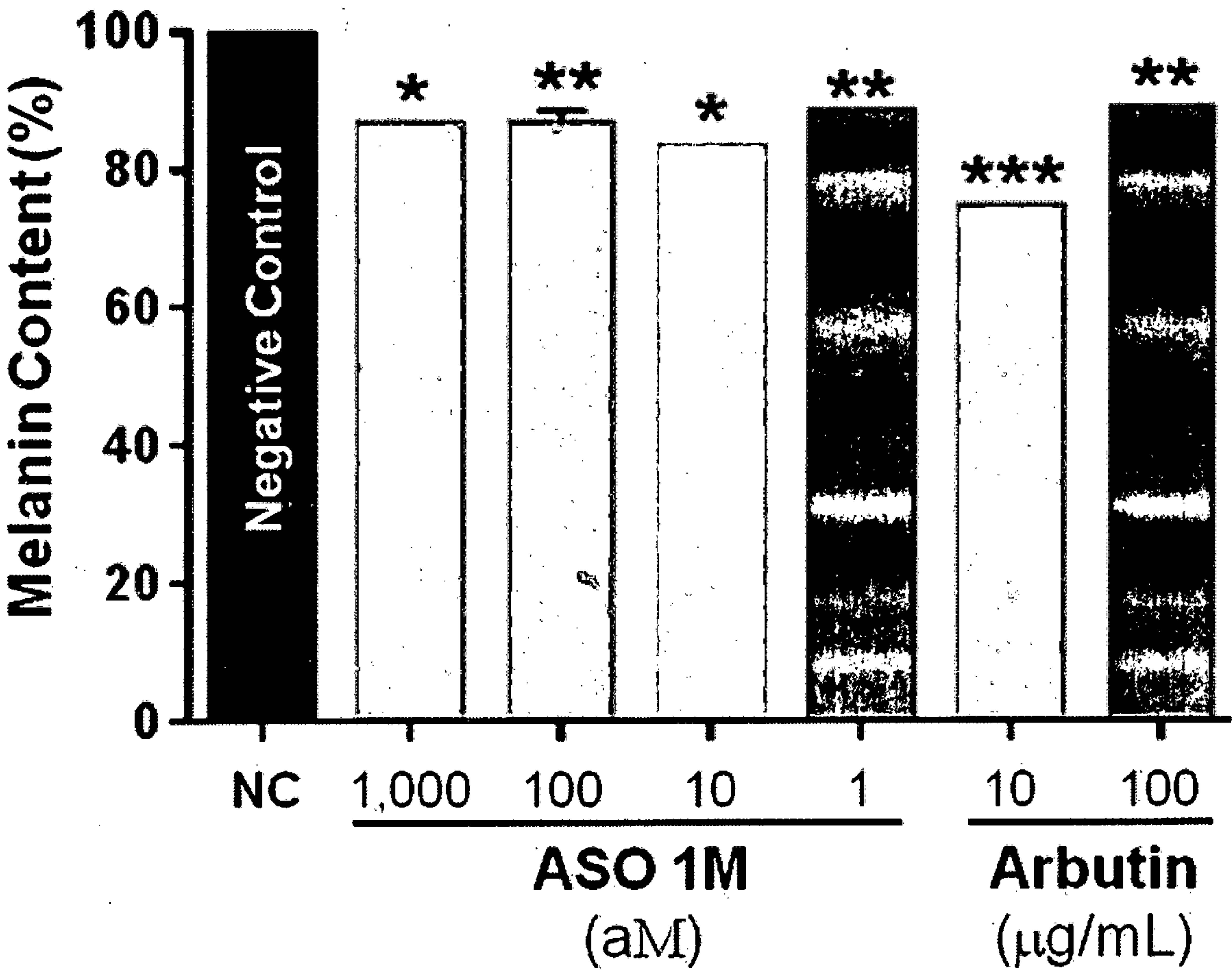


Fig. 12

