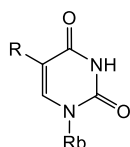


## MODIFIED URIDINES

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### 5-substituted uridines



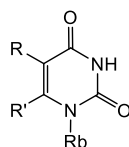
- R: -CH<sub>3</sub> (**m<sup>5</sup>U**)  
-OH (**h<sup>5</sup>U**)  
-OCH<sub>3</sub> (**mo<sup>5</sup>U**)  
-CHO (**f<sup>5</sup>U**)  
-CH<sub>2</sub>NH<sub>2</sub> (**nm<sup>5</sup>U**)  
-CH<sub>2</sub>NHCH<sub>3</sub> (**mnm<sup>5</sup>U**)  
-CH<sub>2</sub>NHCH<sub>2</sub>CH<sub>2</sub>SO<sub>3</sub>H (**τm<sup>5</sup>U**)  
-CH<sub>2</sub>NHCH<sub>2</sub>COOH (**cmnm<sup>5</sup>U**)  
-CH<sub>2</sub>CN (**cnm<sup>5</sup>U**)
- CH<sub>2</sub>COOCH<sub>3</sub> (**mcm<sup>5</sup>U**)  
-CH<sub>2</sub>COOH (**cm<sup>5</sup>U**)  
-CH<sub>2</sub>CONH<sub>2</sub> (**ncm<sup>5</sup>U**)  
-CH<sub>2</sub>CH(OH)COOCH<sub>3</sub> (**S**) (**mchm<sup>5</sup>U**)  
-CH<sub>2</sub>CH(OH)COOH (**S**) (**chm<sup>5</sup>U**)  
-CH<sub>2</sub>CH(OH)COOCH<sub>3</sub> (**R**) (**mchm<sup>5</sup>U**)  
-CH<sub>2</sub>CH(OH)COOH (**R**) (**mchm<sup>5</sup>U**)  
-CH<sub>2</sub>NHCH<sub>2</sub>CHCH<sub>2</sub>(CH<sub>3</sub>)<sub>2</sub> (**inm<sup>5</sup>U**)  
-OCH<sub>2</sub>COOCH<sub>3</sub> (**mcmo<sup>5</sup>U**)  
-OCH<sub>2</sub>COOH (**cmo<sup>5</sup>U**)
- 

### 2'-OMe 5-substituted uridines



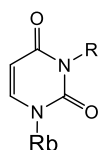
- R: -CH<sub>2</sub>COOCH<sub>3</sub> (**mcm<sup>5</sup>Um**)  
-CH<sub>2</sub>COOH (**cm<sup>5</sup>Um**)
- 

### 6- and 5,6-substituted uridines



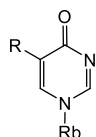
- R: -CH<sub>3</sub>, R': -CH<sub>3</sub> (**m<sup>5</sup>m<sup>6</sup>U**)  
R: H, R': -CH<sub>3</sub> (**m<sup>6</sup>U**)
- 

### N3-substituted uridines



- R: -CH<sub>3</sub> (**m<sup>3</sup>U**)  
-CH<sub>2</sub>CH<sub>2</sub>CH(NH<sub>2</sub>)COOH (**acp<sup>3</sup>U**)
- 

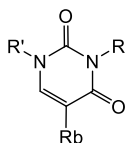
### 4-pyrimidinone ribonucleosides



- R: - H (**H<sup>2</sup>U**)  
- OCH<sub>3</sub> (**mo<sup>5</sup>H<sup>2</sup>U**)  
- CH<sub>2</sub>COOH (**cm<sup>5</sup>H<sup>2</sup>U**)  
- CH<sub>2</sub>COOCH<sub>3</sub> (**mcm<sup>5</sup>H<sup>2</sup>U**)  
- CH<sub>2</sub>CONH<sub>2</sub> (**ncm<sup>5</sup>H<sup>2</sup>U**)  
- CH<sub>2</sub>NHCH<sub>3</sub> (**mnm<sup>5</sup>H<sup>2</sup>U**)  
- CH<sub>2</sub>NHCH<sub>2</sub>COOH (**cmnm<sup>5</sup>H<sup>2</sup>U**)
-

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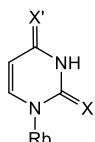
## N1,N3-substituted pseudouridines



R': -CH<sub>3</sub>, R: -H (**m<sup>1</sup>Ψ**)  
R': -H, R: -CH<sub>3</sub> (**m<sup>3</sup>Ψ**)  
R': -CH<sub>3</sub>, R: -CH<sub>3</sub> (**m<sup>1</sup>m<sup>3</sup>Ψ**)  
R': -CH<sub>3</sub>, R: -  
CH<sub>2</sub>CH<sub>2</sub>CH(NH<sub>2</sub>)COOH  
(**m<sup>1</sup>acp<sup>3</sup>Ψ**)

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## 2-, 4-, 2,4-thiouridines

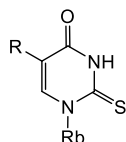


X: S, X': O (**s<sup>2</sup>U**)  
X: O, X': S (**s<sup>4</sup>U**)  
X: S, X': S (**s<sup>2,4</sup>U**)



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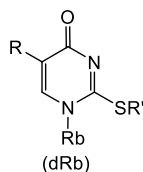
## 5-substituted 2-thiouridines



R: -OH (**h<sup>5</sup>s<sup>2</sup>U**)  
-OCH<sub>3</sub> (**mo<sup>5</sup>s<sup>2</sup>U**)  
-CHO (**f<sup>5</sup>s<sup>2</sup>U**)  
-CH<sub>2</sub>NH<sub>2</sub> (**nm<sup>5</sup>s<sup>2</sup>U**)  
-CH<sub>2</sub>NHCH<sub>3</sub> (**mnm<sup>5</sup>s<sup>2</sup>U**)  
-CH<sub>2</sub>NHCH<sub>2</sub>CH<sub>2</sub>SO<sub>3</sub>H (**τm<sup>5</sup>s<sup>2</sup>U**)  
-CH<sub>2</sub>NHCH<sub>2</sub>COOH (**cmnm<sup>5</sup>s<sup>2</sup>U**)

-CH<sub>2</sub>COOCH<sub>3</sub> (**mcm<sup>5</sup>s<sup>2</sup>U**)  
-CH<sub>2</sub>COOH (**cm<sup>5</sup>s<sup>2</sup>U**)  
-CH<sub>2</sub>CONH<sub>2</sub> (**ncm<sup>5</sup>s<sup>2</sup>U**)  
-CH<sub>2</sub>CH(OH)COOCH<sub>3</sub> (**S**) (**mchm<sup>5</sup>s<sup>2</sup>U**)  
-CH<sub>2</sub>CH(OH)COOCH<sub>3</sub> (**R**) (**mchm<sup>5</sup>s<sup>2</sup>U**)

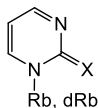
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R: -H R': geranyl (**ges<sup>2</sup>U**)  
R: -CH<sub>2</sub>NHCH<sub>3</sub> R': geranyl (**mnm<sup>5</sup>ges<sup>2</sup>U**)  
R: -CH<sub>2</sub>NHCH<sub>2</sub>COOH R': geranyl (**cmnm<sup>5</sup>ges<sup>2</sup>U**)  
R: -H R': Me (**ms<sup>2</sup>U**)  
R: -CH<sub>2</sub>NHCH<sub>3</sub> R'=Me (**mnm<sup>5</sup>ms<sup>2</sup>U**)  
R: -CH<sub>2</sub>NHCH<sub>2</sub>COOH R': Me (**cmnm<sup>5</sup>ms<sup>2</sup>U**)

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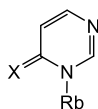
## 2-pyrimidinone and 2-thiopyrimidinone ribonucleosides/2'-deoxyribonucleosides



X: O, R: Rb (**zeb**)  
X: O, R: dRb (**dzeb**)  
X: S, R: Rb (**s<sup>2</sup>zeb**)  
X: S, R: dRb (**s<sup>2</sup>dzeb**)

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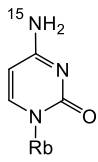
## 6-pyrimidinone and 6-thiopyrimidinone ribonucleosides



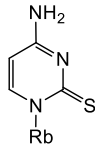
X: O (**H<sup>2,4</sup>O<sup>6</sup>U**)  
X: S (**H<sup>2,4</sup>S<sup>6</sup>U**)

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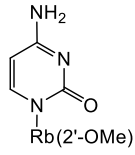
## MODIFIED CYTIDINES



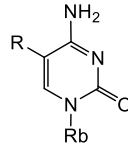
**[<sup>15</sup>N]C**



**s<sup>2</sup>C**

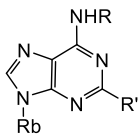


**Cm**



**R: -CH<sub>3</sub> (m<sup>5</sup>C)  
-CH<sub>2</sub>OH (hm<sup>5</sup>C)  
-CHO (f<sup>5</sup>C)**

## MODIFIED ADENOSINES



**R: -Me, R': -H (m<sup>6</sup>A)**

**R: -CH<sub>2</sub>CH=C(CH<sub>3</sub>)<sub>2</sub>, R': -H (i<sup>6</sup>A)**

**R: -CH<sub>2</sub>CH=C(CH<sub>3</sub>)<sub>2</sub>, R': -SCH<sub>3</sub> (ms<sup>2</sup>i<sup>6</sup>A)**

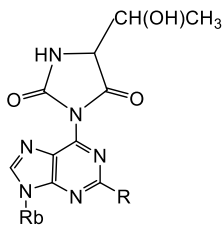
**R: -C(O)NHCH(COOH)CH(OH)CH<sub>3</sub>, R': -H (t<sup>6</sup>A)**

**R: -C(O)NHCH(COOH)CH(OH)CH<sub>3</sub>, R: Me R': -H (m<sup>6</sup>t<sup>6</sup>A)**

**R: -C(O)NHCH(COOH)CH(OH)CH<sub>3</sub>, R': -SCH<sub>3</sub> (ms<sup>2</sup>t<sup>6</sup>A)**

**R: -C(O)NHCH<sub>2</sub>COOH, R': -H (g<sup>6</sup>A)**

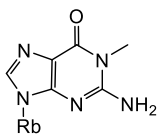
**R: H, R': Me (m<sup>2</sup>A)**



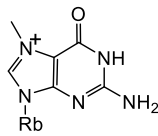
**R: -H (ct<sup>6</sup>A)**

**R: -SCH<sub>3</sub> (ms<sup>2</sup>ct<sup>6</sup>A)**

## MODIFIED GUANOSINES



**m<sup>1</sup>G**



**m<sup>7</sup>G**