

RNase

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RNase

RNase

(28774±1000)

(pH=8.2) (15) / (50)
- / (0.125) (37°C)
(0.06)

Biochemical Study of Ribonuclease in Serum and Tissues of Patients with Uterine Tumors

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ABSTRACT

The activity of alkaline and acidic ribonuclease (RNase) was measured in serum and tissues of women with benign and malignant uterine tumors, compared to women with a curettage as a control group. The results indicated that there is a significant increase in alkaline and acidic RNase activity in sera and tissues of patients with uterine tumors when compared with the control group.

The research also, includes the isolation and purification of the alkaline RNase from the sera of normal women. It has been found that the specific activity of enzyme in proteinous precipitate, after dialysis and gel filtration, was increased and the enzyme shows two peaks. In addition, it has been found that the enzyme has approximate molecular weight of (28774 ± 1000) dalton.

The results also showed that the optimum conditions of the RNase enzyme are: (50) $\mu\text{g/ml}$ of enzyme concentration with reaction (15) minutes at (pH= 8.2) and at (37°C), while the substrate concentration was about (0.125) mmol/L. When the Lineweaver-Burk plot was used, the value of Michaelis-Mentens constants (K_m) is (0.06 mmol). When the duration of storage was studied, the activity of the enzyme is not affected during two months, after that the activity was decreased gradually.

Keywords: Uterine tumors, ribonuclease, tissue.

()

Cancer

.(Sue and Clayton, 2004)

(65 –40)

.(Bagga and Keepanasseril, 2010)

.....RNase

.(Berek and Hacker, 2010)

RNase

.(Raines, 1998)

RNA

124

13700

Four disulfide bonds

(Optimum pH)

.(Arnold *et al.*, 2006)(pH=8.5)

(pH=6.5)

RNase

Arnold)

(Lorenzo and Alessio, 2008)

RNase

.(Mckenna *et al.*, 2007 ; and Ulbrich-Hofmann, 2006

.(Dali *et al.*, 2011)

RNase

(5)

(8)

(11)

(15)

(8)

(15)

(65-22)

(5)

.(Bardon and Shugar, 1980)

RNA

: **RNase** **.1**

Estimation of alkaline RNase activity in serum and tissue

(Bardon *et al.*, 1983)

:

- . (1) Davis -1
- (0.2) (1.1) -2
- : **.2**
- : (1.1) -
- .() (0.05) (1.05) .1
- (° 37) (15) .2
- .(° 0)
- (2) (%70) HCl (1 M) (1.1) .3
- (30)
- .(10) (2000x g) .4
- (1:5) (1) .5
- .(260 nm)

:

(%70)

(1M)

:

RNase activity (U/L) = $\Delta A / t \times V_t / V_s \times \text{dilution factor} \times 1000 / V_s$

.(260 nm) - = ΔA

= V_t

= V_s

.() = t

U

RNase .3

Estimation of acidic RNase activity in serum and tissue

RNase

6.5 = pH

3

40

RNase

:

Protein salting out by ammonium sulfate :() .1

(%75)

60

(Robyt and White, 1987)

120

24

°4

:Dialysis () .2

(NH₄HCO₃)

(Plummer, 1978) (0.1M)

24

:Gel filtration .3

(85)

(Sephadex G-75)

(1.8×100)

(280 nm)

:Freeze drying (Lyophilization) .4

Folin - Lowry method -

.(Schacterle and Pollack, 1973)

(Mean)

(T- test)

(Standard error)
(P ≤ 0.05)

(1)

(P ≤ 0.05)

(%104)

(%53)

(P ≤ 0.05)

(P ≤ 0.001)

(P ≤ 0.05)

% (388-180)

(% 74)

RNase

(1)

(P ≤ 0.05)

RNase :1

mean \pm SD (U / L)		()		المجاميع
RNase $10^3 \times$	RNase $10^3 \times$			
42.85 \pm 23.52	120.77 \pm 63.40	22 – 48	15	()
120.13 \pm 35.62 *	161.58 \pm 48.85	25 – 65	15	
209.00 \pm 46.48 # **	00.246.7 \pm 35 # *	45 – 60	8	

.P \leq 0.05

*

#

.P \leq 0.05

**

.P \leq 0.001(P \leq 0.05)(P \leq 0.001)

.(2)

(P \leq 0.05)

RNase :2

mean ± SD (U / L)				
10 ³ × RNase	10 ³ × RNase	()		
114.50 ± 15.60	92.90 ± 5.10	22 – 48	8	()
100.154.70 ± 42 *	136.20 ± 89.00 *	25 – 65	11	
436 ± 9.96 ** #	420 ± 13.14 ** #	60 – 45	5	

.P ≤ 0.05

.P ≤ 0.001

*

**

#

.P ≤ 0.05

RNase

(2)

RNase

.(Hasan and Al-Shemmaree, 2007)

RNase

.(Hassain *et al.*, 2012)

.(Bast *et al.*, 2000)

.(Bardon *et al.*, 1983) RNase

(3)

RNase

(185 97.1)

(1)

.(3)

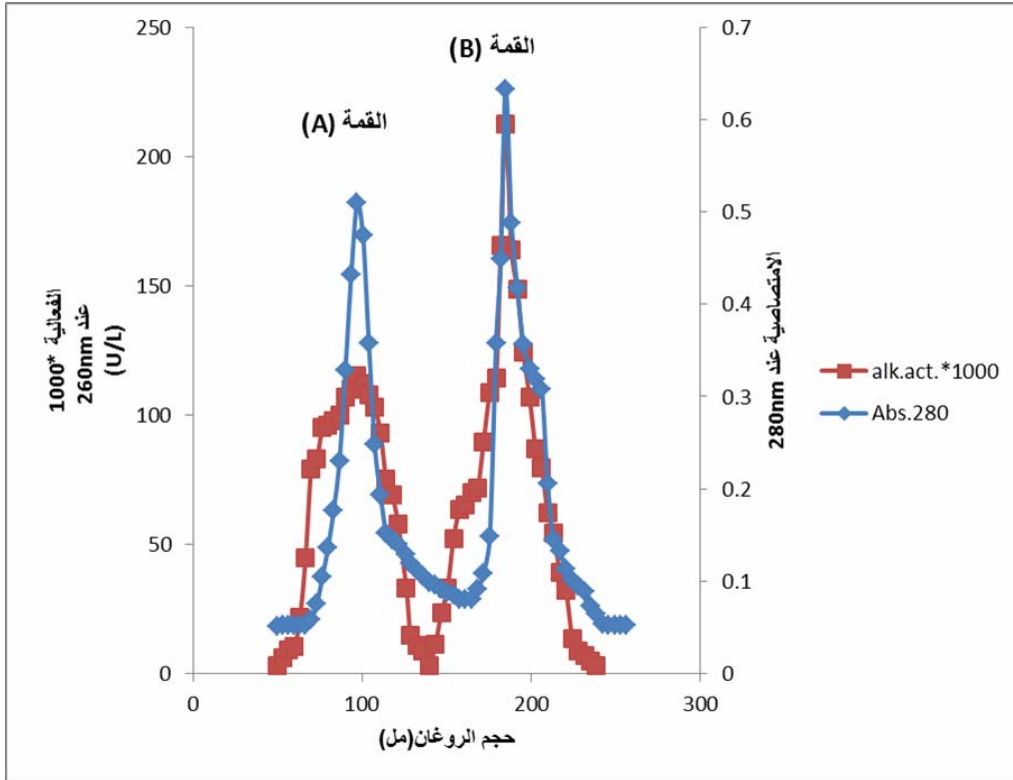
(B)

:3

%		** (/)	$10^3 \times *$ ()) (/	()	(/)	()	
100	1	662	556.620	9277	840	14	60	
35	1.2	800	195.090	9290	243.6	11.6	21	
34	1.36	900	189.105	9005	210	10	21	
50	2.66	1761	278.300	5060	158	2.87	55	A الترشيح الهلامي
85	3.3	2170	473.070	7278	218	3.36	65	B

: U *

: **



:1

(1.8×100)

(B A) (Sephadex G- 75)

(V_i)

(2000000 - 204)

(4) .(V_o)

(Sephadex G-75)

Sephadex G-75

()	()	
80	2000000	Blue dextran
130	67000	Bovine serum albumin
151	45000	Egg albumin
165	36000	Pepsin
210	23000	Papain
270	204	Tryptophan
185	28774	الحزمة المجهولة B

(Elution volume)

(2)

.(185)

(28774±1000)

Fernandez

Fernandez) (Sephadex G-75)

(33000-15000)

(et al., 2000

Itaya

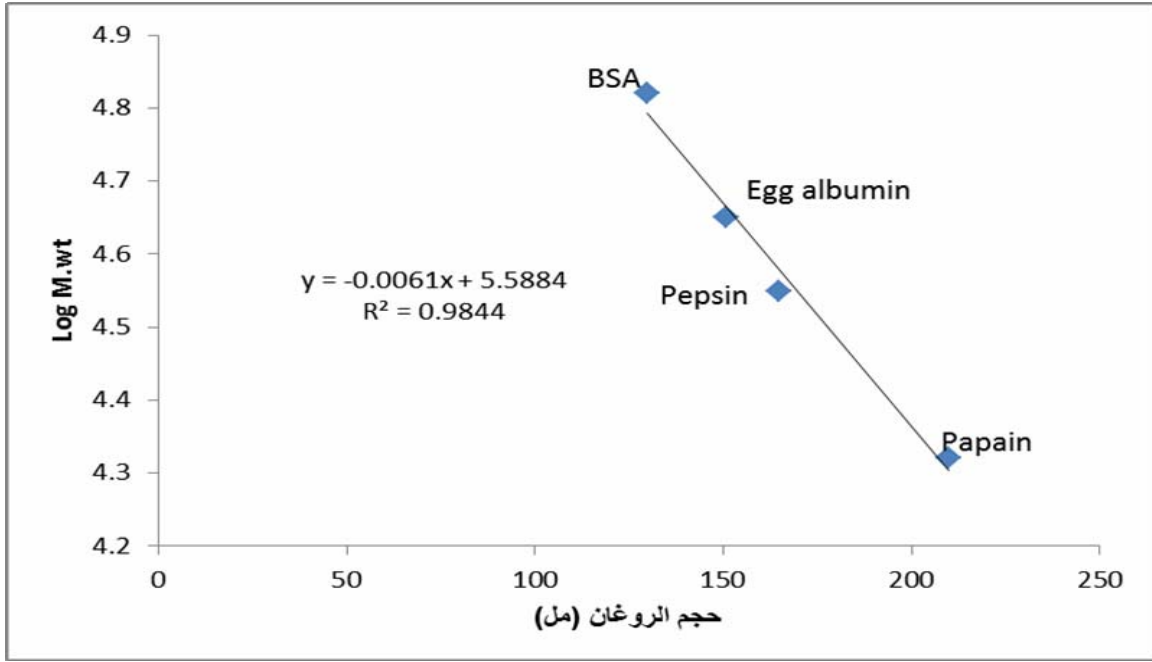
.(Kurihar *et al.*, 1982) (

27000)

.(Itaya, 1990)

(24000)

RNase



: 2

Effect of enzyme concentration

.1

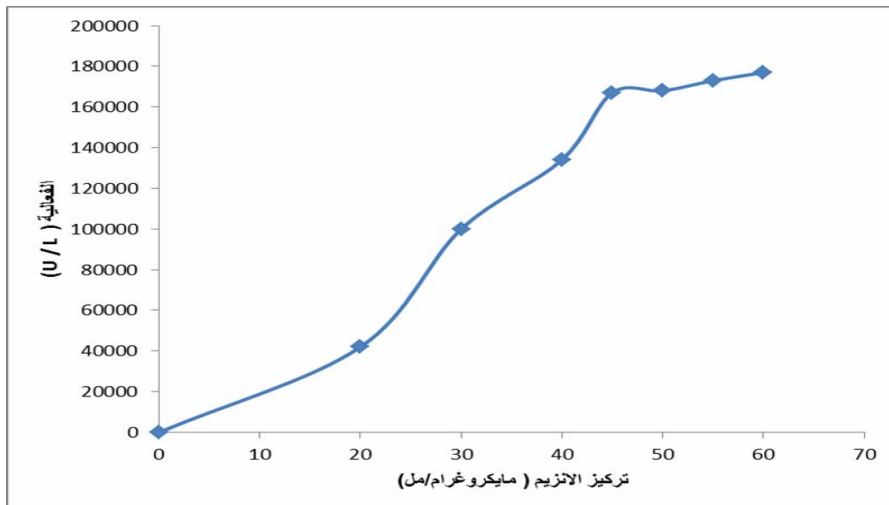
/ (60-20)

(B)

RNase

/ (50)

(3)



:3

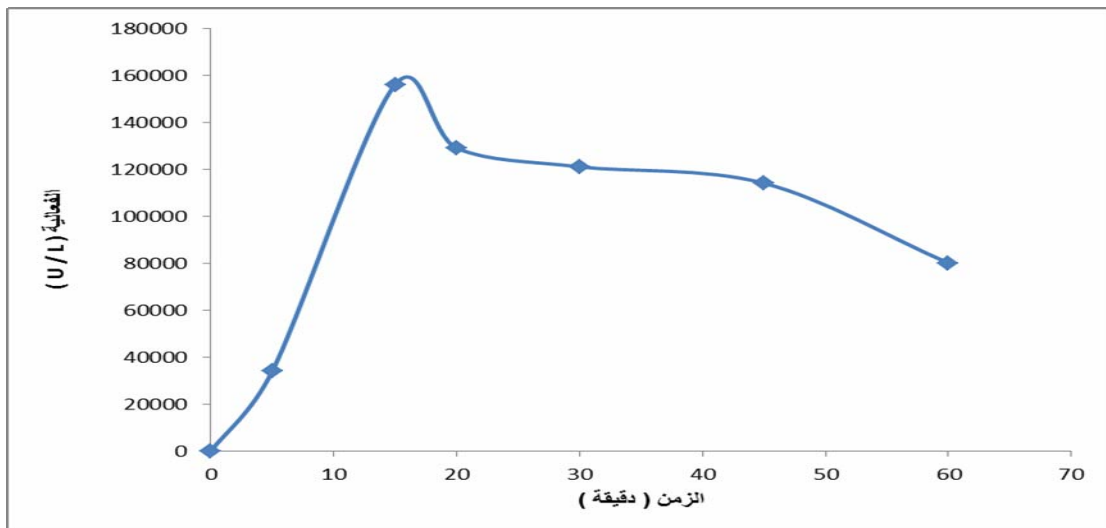
Effect of reaction time

.2

(15)

(4)

(15)



:4

.(B)

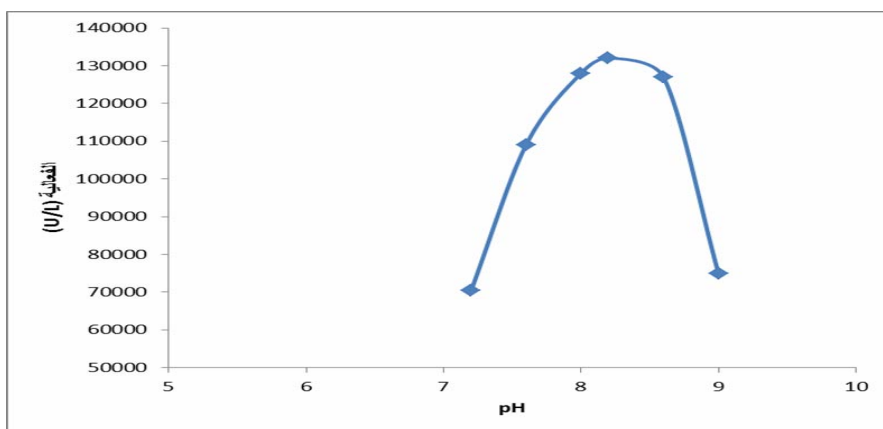
Effect the pH of the buffer solution

.3

(Davis buffer)

.(8.2)

(5)



:5

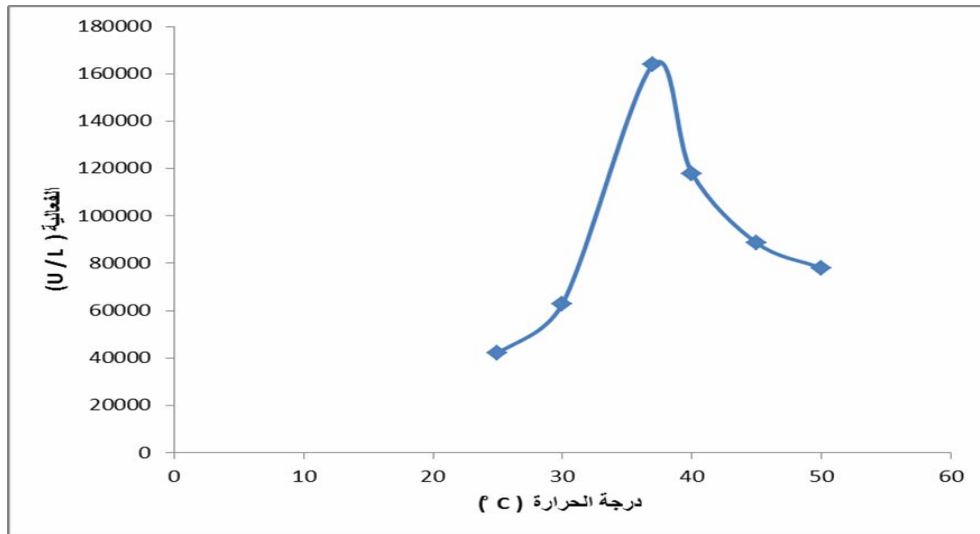
(2002)

.(8.5)

Effect of temperature
(25-50°C)

. 4

.(6)



:6

(37 ° C)

.(2002) (37 °C)

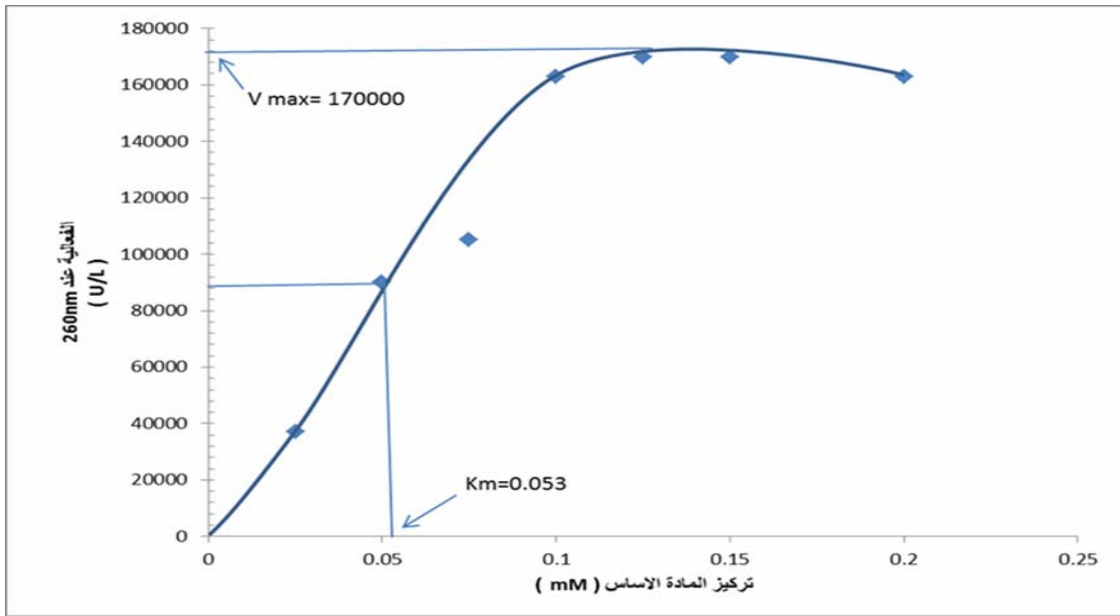
Effect of substrate concentration

.5

0.2-0.025)

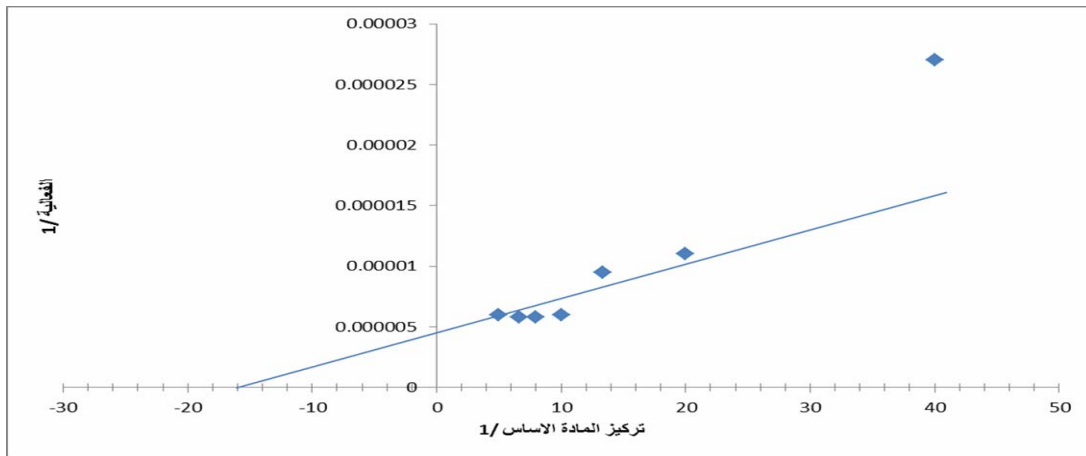
(7) .(/

(Vmax)



RNA :7

(v_{max}) (Lineweaver– Burk plot) –
 (0.06) (K_m) / (200000) RNase
 .(8)



– :8

:RNase .6

.(5)

:5

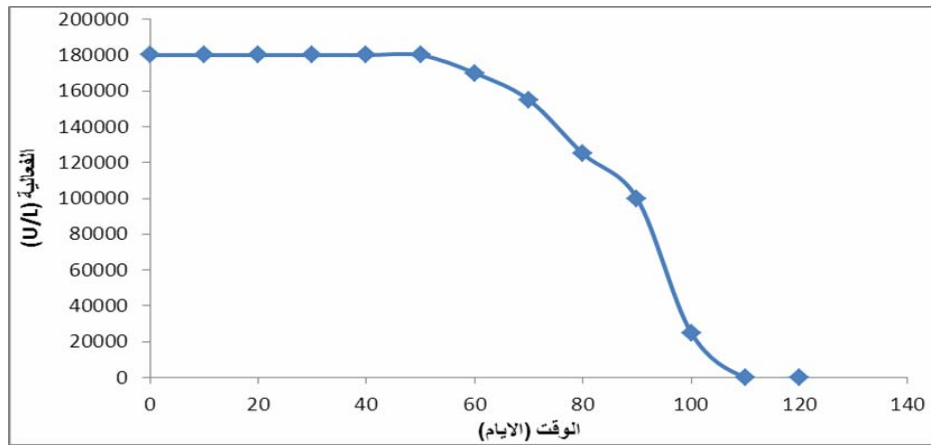
(/)	(°)		()	(/)
0.125	37	8.2	15	50

Effect of RNase stability

.7

(9)

(-20 C°)



:9

(B)

(Al-Issa, 2007)

(%92)

(-20C°)

()

(RNA)

(.2002)

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