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## **APPENDICES**

## APPENDIX A

### Reagent for laboratory experiment



## 1. Reagents for immunohistochemical staining

### 1.1 Phosphate buffer saline (PBS), pH 7.0-7.2

#### Stock solution A

0.2 M $\text{NaH}_2\text{PO}_4\text{H}_2\text{O}$	27.6	g
Distilled water	1,000	ml

#### Stock solution B

0.2 M $\text{NaHPO}_4$	28.4	g
Distilled water	1,000	ml

#### Working solution, 0.01 M PBS

Solution A	23	ml
Solution B	77	ml
Distilled water	1,900	ml
NaCl	18	ml

### 1.2 0.01 M PBS + 0.01% Tween 20

0.01 M PBS	1,000	ml
Tween 20	10	ml

### 1.3 1% Skim milk in PBS

Skim milk	1.0	g
0.01 M PBS	100	ml

### 1.4 Glycerol in PBS for mounting slide

Glycerol : PBS (1 : 4 volume/volume)

## 2. Reagents for nitrate/nitrite ( $\text{NO}_x$ ) determination

### 2.1 Griess reagent

#### 0.1% N-(1-Naphthyl) Ethylenediamine Dihydrochloride (NEDD)

solution

NEDD	0.2	g
Deionized water	200	ml

#### 2% Sulfanilamide (SULF) solution

SULF	2.0	g
5% HCl	100	ml

Both solutions were stored at 4 °C in the dark bottle.

## 2.2 Saturated Vanadium trichloride (VCl<sub>3</sub>) solution

VCl <sub>3</sub>	0.8	g
1M HCl	100	ml

The solution was filtered using filter paper and stored at 4°C for less than two weeks

## 3. Reagents for malondialdehyde (MDA) determination

### 3.1 20 mM Thiobarbituric acid (TBA) in 15% Trichloroacetic acid

#### 15% Trichloroacetic acid

Trichloroacetic acid	75	g
Deionized water	500	ml

#### 20 mM TBA

TBA	1.44	g
15% Trichloroacetic acid	500	ml



### 3.2 n-Butanol in pyridine (15 : 1 volume/volume)

n-Butanol	900	ml
Pyridine	60	ml

### 3.3 7.2% Butylated hydroxytoluene (BHT)

BHT	7.2	g
95% Ethanol	100	ml

### 3.4 1,1,3,3-tetraethoxypropane (TEP) stock

TEP	50	μl
40% Ethanol	25	ml

### 3.5 8.1% Sodium dodecyl sulfate (SDS)

SDS	8.1	g
Deionized water	100	ml

## 4. Reagents for 8-hydroxy-2-deoxy Guanosine (8-oxodG) determination

### 4.1 EIA buffer

EIA buffer concentrate	10	ml
UltraPure water	90	ml

**4.2 Wash buffer**

Wash buffer concentrate	5.0	ml
UltraPure water	2000	ml
Tween 20	1.0	ml

**4.3 Tracer**

8- hydroxy-2-deoxy Guanosine AChE Tracer	100	dn
EIA buffer	6.0	ml

**4.4 Antibody**

Goat Anti-Mouse IgG Coated Plate	1.0	plate
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**5. Reagents for ferric reducing antioxidant power (FRAP) measurement****5.1 300 mM Acetate buffer (pH 3.6)**

Sodium acetate trihydrate	1.87	g
Glacial acetic acid	16	ml
Deionized water adjust to	1,000	ml

**5.2 10 mM 2,4,6-Tripyridyl-s-triazine (TPTZ)**

TPTZ	0.031	g
40 mM HCl	10	ml

**5.3 20 mM Ferric chloride hexahydrate (FeCl<sub>3</sub>.6H<sub>2</sub>O)**

FeCl <sub>3</sub> .6H <sub>2</sub> O	0.054	g
Deionized water	10	ml

**6. Reagents for SDS polyacrylamide gel electrophoresis****6.1. 20% Sodium dodecyl sulphate (SDS)**

SDS	20	g
Distilled water	100	ml
Stored at room temperature		

**6.2 10x SDS electrophoresis buffer**

(0.25 M Tris base, 2.5 M Glycine)

Tris base	30.29	g
Glycine	187.67	g

Distilled water adjust to 1000 ml

The pH of this solution was adjusted to 8.3 and stored at room temperature.

### 6.3 1x SDS electrophoresis buffer

(0.025M Tris base, 0.192M Glycine, 0.1% SDS)

-10x SDS electrophoresis buffer 100 ml

-20% SDS 5.0 ml

-Distilled water adjust to 1000 ml

### 6.4 Acrylamide solution

(30% acrylamide, 0.8% N, N'-methylenebisacrylamide)

Acrylamide 30 g

N, N'-methylenebisacrylamide 0.8 g

Distilled water 100 ml

Stored at 4 °C in the dark bottle

### 6.5 10% Ammonium persulfate solution

Ammonium persulfate 0.05 g

Distilled water 0.5 ml

### 6.6 4x Separating buffer

(1.5 M Tris-HCl, pH 8.8, 0.4% SDS)

Tris base 9.08 g

20% SDS 1.0 ml

Distilled water adjust to 100 ml

The pH of this solution was adjusted to 8.8 and stored at room temperature.

### 6.7 4x Stacking buffer

(0.5 M Tris-HCl, pH 6.8, 0.4% SDS)

Tris base 6.055 g

20% SDS 2.0 ml

Distilled water adjust to 100 ml

The pH of this solution was adjusted to 6.8 and stored at room temperature.

### 6.8 12% Separating gel

30% Acrylamide/Bis	3.2	ml
Separating buffer	2.0	ml
TEMED	10	$\mu$ l
10% Ammonium persulphate	50	$\mu$ l
Distilled water	2.8	ml

#### 6.9 5% Stacking gel

30% Acrylamide/Bis	0.41	ml
Stacking buffer	0.8	ml
TEMED	8.0	$\mu$ l
10% Ammonium persulphate	40	$\mu$ l
Distilled water	1.95	ml

### 7. Reagent for western blotting

#### 7.1 Liver homogenate extraction buffer (pH 7.4)

50 mM Tris-HCl pH 7.4	3.0	g
0.1% SDS	0.5	g
1% Triton X-100	5.0	ml
150 mM NaCl	4.383	g
Distilled water adjust to	500	ml

#### 7.2 Nuclear extraction buffer

##### 7.2.1 Cytoplasmic extraction buffer

10 mM HEPES pH 7.9	1.0	ml
1.5 mM KCl	75	$\mu$ l
10 mM MgCl <sub>2</sub>	2.0	ml
0.5 mM DTT	50	$\mu$ l
0.5% NP-40	25	$\mu$ l
0.5 mM phenylmethylsulfonyl fluoride (PMSF)	60	$\mu$ l

##### 7.2.2 Nuclear extraction buffer

20 mM HEPES pH 7.9	1.0	ml
25% glycerol	12.5	ml
1.5 mM MgCl <sub>2</sub>	150	$\mu$ l
420 mM NaCl	4.2	ml

0.5 mM DTT	5.0	μl
0.5% NP-40	20	μl
0.2 mM EDTA	20	μl
0.5 mM PMSF	12	μl

### 7.3 4x Sample buffer

(40% glycerol, 20% 2-mercaptoethanol, 8% SDS in Tris-HCl)

Glycerol	4.0	ml
2-mercaptoethanol	2.0	ml
SDS	0.4	g
0.5 M Tris-HCl, pH 6.8	5.0	ml
Bromophenol blue	0.0001	g

The pH of this solution was adjusted to 6.8 and stored at 4 °C in the dark bottle.

### 7.4 10x Transfer buffer

Tris-base	58.15	g
Glycine	29.3	g
SDS	3.75	g
Distilled water	1000	ml

The pH of this solution was adjusted to 8.4 and stored at RT

### 7.5 Working transfer buffer

10x Transfer buffer	100	ml
Methanol	200	ml
Distilled water	700	ml

## 8. Reagents for RNA isolation and RT-PCR analysis

### 8.1 Total RNA extraction

Trizol reagent	1,500	μl
Chloroform	300	μl
Isopropanol	750	μl
70% Ethanol	750	μl
0.05% DEPC	210	μl

### 8.2 10x TBE buffer

Tris Base	107.8	g
Boric acid	55	g
EDTA	7.4	g
Distilled water	1000	ml
<b>8.3 2% Agarose gel</b>		
Agarose	0.6	g
1x TBE buffer	30	ml
<b>8.4 Polymerase chain reaction</b>		
10x buffer	2.0	$\mu$ l
50 mM MgCl <sub>2</sub>	1.0	$\mu$ l
10 mM dNTP mix	2.0	$\mu$ l
Platinum Taq	0.1	$\mu$ l
Forward primer (5 $\mu$ M)	2.0	$\mu$ l
Reverse primer (5 $\mu$ M)	2.0	$\mu$ l
Distilled water	6.0	$\mu$ l

**APPENDIX B**

**Letter of Commendation for Presentation Awards**



# Certificate of Appreciation

presented to

*Lakhanawan Charoensuk*

**for an outstanding oral presentation**

In RGJ Seminar Series LXXV

**“Biomedical Sciences: Research for Healthy Society”**

Faculty of Medicine, Khon Kaen University

October 11<sup>th</sup>, 2010

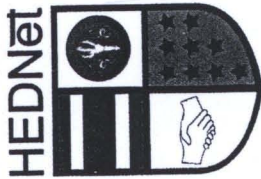
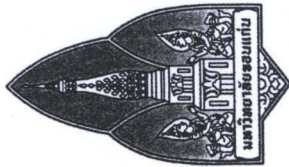


*S. Nongkhai*

Chairman of the Organizing Committee

*Manat Rohmelak*

RGJ Network Coordinator



บัณฑิตวิทยาลัย มหาวิทยาลัยขอนแก่น  
และ  
เครือข่ายอุดมศึกษาภาคตะวันออกเฉียงเหนือตอนบน  
มอบเกียรติบัตรนี้ไว้เพื่อแสดงว่า

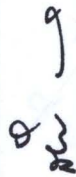
นางสาวลักขณาวัลย์ เจริญสุข

ได้นำเสนอผลงานวิจัยระดับบัณฑิตศึกษา แบบบรรยาย  
ระดับปริญญาโท กลุ่มวิทยาศาสตร์สุขภาพ

ในการประชุมวิชาการเสนอผลงานวิจัยระดับบัณฑิตศึกษา ครั้งที่ 12

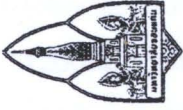
ณ มหาวิทยาลัยขอนแก่น

วันที่ 28 มกราคม พ.ศ.2554



(รองศาสตราจารย์ ดร.ลำปาง แม่หมาตย์)  
คณบดีบัณฑิตวิทยาลัย มหาวิทยาลัยขอนแก่น





บัณฑิตวิทยาลัย มหาวิทยาลัยขอนแก่น

มอบเกียรติบัตรนี้ไว้เพื่อแสดงว่า

**นางสาวลักขณาวลัย เจริญสุข**

หลักสูตรวิทยาศาสตรมหาบัณฑิต สาขาวิชาปรสิตวิทยา

เป็นผู้สร้างชื่อเสียงให้กับมหาวิทยาลัยขอนแก่น ประจำปีการศึกษา 2553

โดยได้รับรางวัล outstanding oral presentation in RGJ Seminar Series LXXV

จาก การประชุมวิชาการทาง RGJ-Seminar Series LXXV (Biomedical Sciences :

Research for Health Society) วันที่ 11 ตุลาคม 2553 ณ คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น

ให้ไว้ ณ วันที่ 28 มกราคม พ.ศ. 2554

(รองศาสตราจารย์ ดร. สำปาง แมนมัตย์)

คณบดีบัณฑิตวิทยาลัย

## RESEARCH PUBLICATIONS

1. **Charoensuk, L.**, Pinlaor, P., Prakobwong, S., Hiraku, Y., Laothong, U., Ruangjirachuporn, W., Yongvanit, P. and **Pinlaor, S\***. Curcumin induces a nuclear factor-erythroid 2-related factor 2-driven response against oxidative and nitrative stress after praziquantel treatment in liver fluke-infected hamsters. *Int J Parasitol*, 2011, In-press.
2. **Lakhanawan Charoensuk**, Porntip Pinlaor, Suksanti Prakobwong, Yusuke Hiraku, Umawadee Laothong, Wipaporn Ruangjirachuporn, Puangrat Yongvanit, Somchai Pinlaor. Curcumin induces Nrf2-driven stress response against oxidative and nitrative stress after praziquantel-treated liver fluke-infection. (*Oral presentation*) The RGJ Seminar Series LXXV “ Biomedical Sciences: Research for Healthy Society”; 11 October 2010 Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand.
3. **Lakhanawan Charoensuk**, Porntip Pinlaor, Wipaporn Ruangjirachuporn, Puangrat Yongvanit, Somchai Pinlaor. Protective effect of curcumin against adverse effect after praziquantel treatment in liver fluke-infected hamsters. (*Oral presentation*) The 12<sup>th</sup> Graduate Research Conference 2011; 28 January 2011, Khon Kaen University, Khon Kaen, Thailand.

## VITAE



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- |           |   |
|-----------|---|
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| 2009-2011 | Master of Science (Parasitology)<br>Khon Kaen University        |
- Research support :** A grant of Liver Fluke and Cholangiocarcinoma Research Center and The Invitation Research Fund from Faculty of Medicine, Khon Kaen University.
- Awards:** The oral presentation award. Curcumin induces Nrf2-driven stress response against oxidative and nitrative stress after praziquantel-treated liver fluke-infection. In RGJ Seminar Series LXXV “Biomedical Sciences: Research for Healthy Society”, 11 October 2010, Khon Kaen University, Khon Kaen, Thailand.

