

## Appendices

### Appendix(1)

#### Protparam of Cyclooxygenase2

##### Sequence alignment:

10 20 30 40 50 60  
MLARALLCA VLALSHTANP CSHPCQNRG VCMSVGFQY  
KDCSTRTGFY GENCSTPEFL

70 80 90 100 110 120  
TRIKLFLKPT PNTVHYILTH FKGFWNVVNN IPFLRNAIMS  
YVLTSRSHLI DSPPTYNADY

130 140 150 160 170 180  
GYKSWEAFSN LSYYTRALPP VPDDCPTPLG VKGKKQLPDS  
NEIVEKLLLR RKFIPDPQGS

190 200 210 220 230 240  
NMMFAFFAQH FTHQFFKTDH KRGPFTNGL GHGVDLNHIY  
GETLARQRKL RLFKDGKMKY

250 260 270 280 290 300  
QIIDGEMYPP TVKDTQAEMI YPPQVPEHLR FAVGQEVFGL  
VPGLMMYATI WLREHNRVCD

310 320 330 340 350 360  
VLKQEHPEWG DEQLFQTSRL ILIGETIKIV IEDYVQHLSG  
YHFCLKFDPE LLFNKQFQYQ

370 380 390 400 410 420  
NRIAAEFNTL YHWHPLL PDT FQIHDQKYN Y QQFIYNN SIL  
LEHGITQFVE SFTRQIAGRV

430 440 450 460 470 480  
AGGRNVPPAV QKVSQASIDQ SRQMKYQSFN EYRKRFMLKP  
YESFEELTGE KEMSAELEAL

490 500 510 520 530 540  
YGDIDAVELY PALLVEKPRP DAIFGETMVE VGAPFSLKGL  
MGNVICSPAY WKPSTFGGEV

550 560 570 580 590 600  
GFQIINTASI QSLICNNVKG CPFTSFSVPD PELIKTVTIN  
ASSRSGLDD INPTVLLKER

Number of amino acids: 604

Molecular weight: 68996.1

Theoretical pI: 7.02

Amino acid composition:

Ala (A) 31 5.1%

Arg (R) 27 4.5%

Asn (N) 29 4.8%

Asp (D) 26 4.3%

Cys (C) 13 2.2%

Gln (Q) 31 5.1%

Glu (E) 36 6.0%

Gly (G) 37 6.1%

His (H) 19 3.1%

Ile (I) 34 5.6%

Leu (L) 57 9.4%

Lys (K) 34 5.6%

Met (M) 15 2.5%

Phe (F) 38 6.3%

Pro (P) 40 6.6%

Ser (S) 35 5.8%

Thr (T) 34 5.6%

Trp (W) 6 1.0%

Tyr (Y) 27 4.5%

Val (V) 35 5.8%

Pyl (O) 0 0.0%

Sec (U) 0 0.0%

(B) 0 0.0%

(Z) 0 0.0%

(X) 0 0.0%

Total number of negatively charged residues (Asp + Glu): 62

Total number of positively charged residues (Arg + Lys): 61

Atomic composition:

Carbon C 3129

Hydrogen H 4791

Nitrogen N 823

Oxygen O 885

Sulfur S 28

Formula:  $C_{3129}H_{4791}N_{823}O_{885}S_{28}$

Total number of atoms: 9656

Extinction coefficients:

Extinction coefficients are in units of  $M^{-1} \text{ cm}^{-1}$ , at 280 nm measured in water.

Ext. coefficient 73980

Abs 0.1% (=1 g/l) 1.072, assuming all pairs of Cys residues form cystines

Ext. coefficient 73230

Abs 0.1% (=1 g/l) 1.061, assuming all Cys residues are reduced

The N-terminal of the sequence considered is M (Met).

The estimated half-life is: 30 hours (mammalian reticulocytes, in vitro).

>20 hours (yeast, in vivo).

>10 hours (Escherichia coli, in vivo).

Instability index:

The instability index (II) is computed to be 37.67

This classifies the protein as stable.

Aliphatic index: 80.70

- Grand average of Hydropathicity (GRAVY): -0.287

## Appendix(2)

### Protparamof Kinesin

10      20      30      40      50      60  
MASQFCLPES PCLSPLKPLK PHFGDIQEGI YAAIQRSDKR  
IHLAVVTEIN RENYWVTVEW

70      80      90      100      110      120  
VEKAVKKGKK IDLETILLN PALDSAEHPM PPLPLSPLAL  
APSSAIRDQR TVTKWVAMIP

130      140      150      160      170      180  
QKNQTASGDS LDVRVPSKPC LMKQKKSPCL WEIQKLQEQR  
EKRRRLQQEI RARRALDVNT

190      200      210      220      230      240  
RNPNYEIMHM IEEYRRHLDS SKISVLEPPQ EHRICVCVRK  
RPLNQRETTL KLDLIITVPS

250      260      270      280      290      300  
DNVVMVHESK QKVDLTRYLQ NQTFCFDHAF DDKASNELVY  
QFTAQPLVES IFRKGMATCF

310      320      330      340      350      360  
AYGQTRSGKT YTVGGDFSGT AQDCSKGIYA LVAQDVFLLL  
RNSTYEKLDL KVYGTFFEIY

370      380      390      400      410      420  
GGKVYDLLNW KKKLQVLEDG NQQIQVVGLQ EKEVCCVEEV  
LNLVEIGNSC RTSRQTSVNA

430      440      450      460      470      480  
HSSRSHAVFQ IILKSGGIMH GKFSLVDLAG NERGADTTKA  
SRKRQLEGAE INKSLLALKE

490      500      510      520      530      540  
CILALGQNKP HTPFRASKLA LVLRDSFIGQ NSSTCMIATI  
SPGMTSCENT LNTLRYANRV

550      560      570      580      590      600  
KKLNVDVRPY HRGHYPIGHE APRMLKSHIG NSEMSLQRDE

FIKIPYVQSE EQKEIEEVET

610 620 630 640 650 660  
LPTLLGKDDT ISGKGSSQWL ENIQERAGGV HHDIDFCIAR  
SLSILEQKID ALTEIQKCLK

670  
LLLADLHVKS KVE

Number of amino acids: 673

Molecular weight: 76197.7

Theoretical pI: 8.89

Amino acid composition:

[CSV format](#)

Ala (A)	39	5.8%
Arg (R)	40	5.9%
Asn (N)	27	4.0%
Asp (D)	32	4.8%
Cys (C)	16	2.4%
Gln (Q)	39	5.8%
Glu (E)	48	7.1%
Gly (G)	34	5.1%
His (H)	19	2.8%
Ile (I)	42	6.2%
Leu (L)	71	10.5%
Lys (K)	53	7.9%
Met (M)	13	1.9%
Phe (F)	18	2.7%
Pro (P)	30	4.5%
Ser (S)	49	7.3%
Thr (T)	35	5.2%
Trp (W)	6	0.9%
Tyr (Y)	17	2.5%
Val (V)	45	6.7%
Pyl (O)	0	0.0%
Sec (U)	0	0.0%

(B) 0 0.0%

(Z) 0 0.0%

(X) 0 0.0%

Total number of negatively charged residues (Asp + Glu): 80  
Total number of positively charged residues (Arg + Lys): 93

Atomic composition:

Carbon	C	3362
Hydrogen	H	5438
Nitrogen	N	956
Oxygen	O	1001
Sulfur	S	29

Formula:  $C_{3362}H_{5438}N_{956}O_{1001}S_{29}$   
Total number of atoms: 10786

Extinction coefficients:

Extinction coefficients are in units of  $M^{-1} cm^{-1}$ , at 280 nm measured in water.

Ext. coefficient 59330  
Abs 0.1% (=1 g/l) 0.779, assuming all pairs of Cys residues form cystines

Ext. coefficient 58330  
Abs 0.1% (=1 g/l) 0.766, assuming all Cys residues are reduced

The N-terminal of the sequence considered is M (Met).

The estimated half-life is: 30 hours (mammalian reticulocytes, in vitro).  
>20 hours (yeast, in vivo).  
>10 hours (Escherichia coli, in vivo).

Instability index:

The instability index (II) is computed to be 49.13  
This classifies the protein as unstable.

Aliphatic index: 90.67

Grand average of hydropathicity (GRAVY): -0.413

### Appendix (3)

#### Protparam of Matrix Metalloproteinase 9

##### Sequence

10 20 30 40 50 60  
MSLWQPLVLV LLVLGCCFAA PRQRQSTLVL FPGDLRTNLT  
DRQLAEEYLY RYGYTRVAEM

70 80 90 100 110 120  
RGESKSLGPA LLLQKQLSL PETGELDSAT LKAMRTPRCG  
VPDLGRFQTF EGDWKWHHHN

130 140 150 160 170 180  
ITYWIQNYSE DLPRAVIDDA FARAFALWSA VTPLTFTRVY  
SRDADIVIQF GVAEHGDGYP

190 200 210 220 230 240  
FDGKDGLLAH AFPPGPGIQG DAHFDDDELW SLGKGVVVPT  
RFGNADGAAC HPPFIFEGRS

250 260 270 280 290 300  
YSACTTDGRS DGLPWCSTTA NYDTDDRFGF CPSELYTRD  
GNADGKPCQF PFIFQGQSYS

310 320 330 340 350 360  
ACTTDGRSDG YRWCATTANY DRDKLFGFCP TRADSTVMGG  
NSAGELCVFP FTFLGKEYST

370 380 390 400 410 420  
CTSEGRGDGR LWCATTSNFD SDKKWFPCPD QGYSLFLVAA  
HEFGHALGLD HSSVPEALMY

430 440 450 460 470 480  
PMYRFTEGPP LHKDDVNGIR HLYGPRPEPE PRPPTTTPQ  
PTAPPTVCPT GPPTVHPSER

490 500 510 520 530 540  
PTAGPTGPPS AGPTGPPTAG PSTATTVPLS PVDDACNVNI  
FDAIAEIGNQ LYLFKDGKYW

550 560 570 580 590 600



RFSEGRGSRP QGPFLIADKW PALPRKLDSV FEEPLSKKLF  
FFSGRQVWVY TGASVLGPRR

610 620 630 640 650 660  
LDKLGLGADV AQVTGALRSG RGKMLLFSGR RLWRFDVKAQ  
MVDPRSASEV DRMFPGVPLD

670 680 690 700  
THDVFQYREK AYFCQDRFYW RVSSRSELNQ VDQVGYVTYD  
ILQCPED

Number of amino acids: 707

Molecular weight: 78427.2

Theoretical pI: 5.69

Amino acid composition:

Ala (A)	51	7.2%
Arg (R)	49	6.9%
Asn (N)	14	2.0%
Asp (D)	54	7.6%
Cys (C)	19	2.7%
Gln (Q)	25	3.5%
Glu (E)	29	4.1%
Gly (G)	67	9.5%
His (H)	14	2.0%
Ile (I)	14	2.0%
Leu (L)	62	8.8%
Lys (K)	22	3.1%
Met (M)	9	1.3%
Phe (F)	44	6.2%
Pro (P)	60	8.5%
Ser (S)	44	6.2%
Thr (T)	50	7.1%
Trp (W)	14	2.0%
Tyr (Y)	27	3.8%
Val (V)	39	5.5%
Pyl (O)	0	0.0%
Sec (U)	0	0.0%

(B) 0 0.0%  
(Z) 0 0.0%  
(X) 0 0.0%

Total number of negatively charged residues (Asp + Glu): 83

Total number of positively charged residues (Arg + Lys): 71

#### Atomic composition:

Carbon	C	3517
Hydrogen	H	5297
Nitrogen	N	957
Oxygen	O	1034
Sulfur	S	28

Formula:  $C_{3517}H_{5297}N_{957}O_{1034}S_{28}$

Total number of atoms: 10833

#### Extinction coefficients:

Extinction coefficients are in units of  $M^{-1} cm^{-1}$ , at 280 nm measured in water.

Ext. coefficient 118355

Abs 0.1% (=1 g/l) 1.509, assuming all pairs of Cys residues form cystines

Ext. coefficient 117230

Abs 0.1% (=1 g/l) 1.495, assuming all Cys residues are reduced

The N-terminal of the sequence considered is M (Met).

The estimated half-life is: 30 hours (mammalian reticulocytes, in vitro).

>20 hours (yeast, in vivo).

>10 hours (Escherichia coli, in vivo).

#### Instability index:

The instability index (II) is computed to be 41.21

This classifies the protein as unstable.

Aliphatic index: 65.13

Grand average of hydropathicity (GRAVY): -0.392

## Appendix(4)

### Protparam of Epithelial Growth Factor Receptor

#### User-provided sequence:

10 20 30 40 50 60  
GSHMASGEAP NQALLRILKE TEFKKIKVLG SGAFGTVYKG  
LWIPEGEKVK IPVAIKELRE

70 80 90 100 110 120  
ATSPKANKEI LDEAYVMASV DNPHVCRLLG ICLTSTVQLI  
TQLMPFGCLL DYVREHKDNI

130 140 150 160 170 180  
GSQYLLNWCV QIAKGMNYLE DRRLVHRDLA ARNVLVKTPQ  
HVKITDFGLA KLLGAEKEY

190 200 210 220 230 240  
HAEGGKVPIK WMALESILHR IYTHQSDVWS YGVTVWELMT  
FGSKPYDGIP ASEISSILEK

250 260 270 280 290 300  
GERLPQPPIC TIDVYMIMVK CWMIDADSRP KFRELIIIEFS  
KMARDPQRYL VIQGDERMHL

310 320 330  
PSPTDSNFYR ALMDEEDMDD VVDADEYLIP QQG

Number of amino acids: 333

Molecular weight: 37827.7

Theoretical pI: 5.67

Amino acid composition: [CSV format](#)

Ala (A)	21	6.3%
Arg (R)	16	4.8%
Asn (N)	8	2.4%
Asp (D)	21	6.3%

Cys (C)	6	1.8%
Gln (Q)	12	3.6%
Glu (E)	26	7.8%
Gly (G)	21	6.3%
His (H)	9	2.7%
Ile (I)	25	7.5%
Leu (L)	33	9.9%
Lys (K)	23	6.9%
Met (M)	13	3.9%
Phe (F)	8	2.4%
Pro (P)	18	5.4%
Ser (S)	18	5.4%
Thr (T)	13	3.9%
Trp (W)	6	1.8%
Tyr (Y)	13	3.9%
Val (V)	23	6.9%
Pyl (O)	0	0.0%
Sec (U)	0	0.0%

(B) 0 0.0%

(Z) 0 0.0%

(X) 0 0.0%

Total number of negatively charged residues (Asp + Glu): 47

Total number of positively charged residues (Arg + Lys): 39

Atomic composition:

Carbon	C	1696
Hydrogen	H	2680
Nitrogen	N	448
Oxygen	O	492
Sulfur	S	19

Formula:  $C_{1696}H_{2680}N_{448}O_{492}S_{19}$

Total number of atoms: 5335

Extinction coefficients:

Extinction coefficients are in units of  $M^{-1} cm^{-1}$ , at 280 nm measured in water.

Ext. coefficient 52745

Abs 0.1% (=1 g/l) 1.394, assuming all pairs of Cys residues form cystines

Ext. coefficient 52370

Abs 0.1% (=1 g/l) 1.384, assuming all Cys residues are reduced

The N-terminal of the sequence considered is G (Gly).

The estimated half-life is: 30 hours (mammalian reticulocytes, in vitro).

>20 hours (yeast, in vivo).

>10 hours (Escherichia coli, in vivo).

Instability index:

The instability index (II) is computed to be 43.79

This classifies the protein as unstable.

Aliphatic index: 94.26

Grand average of hydropathicity (GRAVY): -0.221

## Appendix(5)

### Protparam of Janus Kinase

#### User-provided sequence:

10    20    30    40    50    60  
MGMACLTMTE MEGTSTSSIY QNGDISGNAN SMKQIDPVLQ  
VYLYHSLGKS EADYLTFPSG

70    80    90    100    110    120  
EYVAEEICIA ASKACGITPV YHNMFALMSE TERIWYPPNH  
VFHIDESTRH NVLYRIRFYF

130    140    150    160    170    180  
PRWYCSGSNR AYRHGISRGA EAPLLDDFVM SYLFAQWRHD  
FVHGWIQVPV THETQEECLG

190    200    210    220    230    240  
MAVLDMRIA KENDQTPLAI YNSISYKTFL PKCIRAKIQD  
YHILTRKRIR YRFRRFIQQF

250    260    270    280    290    300  
SQCKATARNL KLKYLINLET LQSAFYTEKF EVKEPGSGPS  
GEEIFATIII TGNGGIQWSR

310    320    330    340    350    360  
GKHKESETLT EQDLQLYCDF PNIIDVSIKQ ANQEGSNESR  
VVTIHKQDGK NLEIELSSLR

370    380    390    400    410    420  
EALSFVSLID GYYRLTADAH HYLCKEVAPP AVLENIQSNC  
HGPISMDFAI SKLKKAGNQT

430    440    450    460    470    480  
GLYVLRCSKP DFNKYFLTFA VERENVIEYK HCLITKNENE  
EYNLSGTTKN FSSLKDLLNC

490    500    510    520    530    540  
YQMETVRSDN IIFQFTKCCP PKPKDKSNLL VFRTNGVSDV  
PTSPTLQRPT HMNQMVFHKI

550 560 570 580 590 600  
RNEDLIFNES LGQGTFTKIF KGVRREVG DY GQLHETE VLL  
KVLDKAHRNY SESFFEAASM

610 620 630 640 650 660  
MSKLSHKHLV LNYGVCVCGD ENILVQEFVK FGSLD TYLKK  
NKNCINILWK LEVAKQLAWA

670 680 690 700 710 720  
MHFLEENTLI HGNVCAKNIL LIREEDRKTG NPPFIKLSDP  
GISITVLPKD ILQERIPWVP

730 740 750 760 770 780  
PECIENPKNL NLATDKWSFG TTLWEICSGG DKPLSALDSQ  
RKLQFYEDRH QLPAPKW AEL

790 800 810 820 830 840  
ANLINNCMDY EPDFRPSFRA IIRDLNSLFT PDYELLTEND  
MLPNMRIGAL GFSGAFEDRD

850 860 870 880 890 900  
PTQFEERHLK FLQQLGKGNF GSVEMCRYDP LQDNTGEVVA  
VKKLQHSTEE HLRDFEREIE

910 920 930 940 950 960  
ILKSLQHDNI VKYKGV CYSA GRRNLKLIME YLPYGSLRDY  
LQKHKERIDH IKLLQYTSQI

970 980 990 1000 1010 1020  
CKGMEYLGTK RYIHRDLATR NILVENENRV KIGDFGLTKV  
LPQDKEYYKV KEPGESPIFW

1030 1040 1050 1060 1070 1080  
YAPESLTESK FSVASDVWSF GVVLYELFTY IEKSKSPPAE  
FMRMIGNDKQ GQMIVFHLIE

1090 1100 1110 1120 1130  
LLKNNGRLPR PDGCPDEIYM IMTECWNNNV NQRPSFRDLA  
LRVDQIRDNM AG

Number of amino acids: 1132

Molecular weight: 130673.5

Theoretical pI: 6.82

Amino acid composition: [CSV format](#)

Ala (A)	52	4.6%
Arg (R)	60	5.3%
Asn (N)	66	5.8%
Asp (D)	57	5.0%
Cys (C)	27	2.4%
Gln (Q)	45	4.0%
Glu (E)	86	7.6%
Gly (G)	62	5.5%
His (H)	33	2.9%
Ile (I)	76	6.7%
Leu (L)	109	9.6%
Lys (K)	79	7.0%
Met (M)	30	2.7%
Phe (F)	54	4.8%
Pro (P)	51	4.5%
Ser (S)	72	6.4%
Thr (T)	54	4.8%
Trp (W)	14	1.2%
Tyr (Y)	49	4.3%
Val (V)	56	4.9%
Pyl (O)	0	0.0%
Sec (U)	0	0.0%

(B) 0 0.0%

(Z) 0 0.0%

(X) 0 0.0%

Total number of negatively charged residues (Asp + Glu): 143

Total number of positively charged residues (Arg + Lys): 139

Atomic composition:

Carbon C 5848

Hydrogen H 9096



Nitrogen	N	1582
Oxygen	O	1705
Sulfur	S	57

Formula:  $C_{5848}H_{9096}N_{1582}O_{1705}S_{57}$

Total number of atoms: 18288

Extinction coefficients:

Extinction coefficients are in units of  $M^{-1} cm^{-1}$ , at 280 nm measured in water.

Ext. coefficient 151635

Abs 0.1% (=1 g/l) 1.160, assuming all pairs of Cys residues form cystines

Ext. coefficient 150010

Abs 0.1% (=1 g/l) 1.148, assuming all Cys residues are reduced

The N-terminal of the sequence considered is M (Met).

The estimated half-life is: 30 hours (mammalian reticulocytes, in vitro).

>20 hours (yeast, in vivo).

>10 hours (Escherichia coli, in vivo).

Instability index:

The instability index (II) is computed to be 47.71

This classifies the protein as unstable.

Aliphatic index: 82.68

Grand average of hydropathicity (GRAVY): -0.433





