Additional file 5

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                    10        20        30        40        50        60        70        80        90       100       110
                    ....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|
PUl-1               M-------------------------------------------------------------------------------RAQADRNACFRLRSKCFT----LAQIAHA
PUl-2               M-------------------------------------------------------------------------------HSPEERKICCRLRTQDIP----LTVIATA
PGv-1               M-------------------------------------------------------------------------SIRKSNDYKLTAVNHYLVEDKS----QEEICKI
HMa-1               ------------------------------------------------------------------------------------------------------------
ROr-1               MTKNTFFYEDGHDNVYNKDGERVFDPMEGELTEISDPNVVLETITSQKSYLSLKPAEKETTAKDSTKKAIEVVKKSSVYKDYNDQTREIFINRMIECPTERGKVTLHAKD
ROr-2               ------------------------------------------------------------------------------------------------------------
MCi-1               M-------------------------------------------EKMFHKCHLINSPGLYFSQYLIHFQLKSTEISNMKHLTCCEKAYIHGLNDACMQ----VPEIAIR
SMAR30              MKIDENISLDKSENQLNNTTSNEQNFANQQIRSIFQQQAELDL-----------PNPLTAETNSDTAVIQIRRYNRSAYNTTSLDKKKIFIKCYEECKT----IVEAAEI
Mariner-2_MLP       M-----------------------------------------------CEGISPLPSKFLEQLLIIVSQKMKTRCLEPVERARIIGMHKACLS----GTKISKK
Mariner-1_PGr       M-----------------------------------------------------------------VRTKPDRKPHLSTETKAMIVGMARACKS----IAYLSQE
IS630               M-----------------------------------------------------PIIAPISRDERRLMQKAIHKTHDKNYARRLTAMLMLHRCDR----VSDVART
ISSoc15             M-----------------------------------------------------------------------PTHSLDLRQRVVAAYQAGNTS----IRQVAKR

                   120       130       140       150       160       170       180       190       200       210       220
                    ....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|
PUl-1               LDICARTVQRWLKGES-----AAAR-PLNRNHTRKLTSLQEERLIEFFLD-------ENTSRLRDGVAFVAQSF-NLCVSERTLGRILHRH-RLSFKRAVSAYHEA----
PUl-2               LNVCKRTVQRWLKSTP-----IVSR-PLNRSHLRKLNETQREKVIEYFLN-------NNTSRIRDGVEFVRNAF-AIFVSRSTLQRVLHES-QLTFKKASTAYKEA----
PGv-1               FKCSRRSLMRWVDRYEKDG--NVDI-HYRKPIAYKVKKEHVAFLLQEMKK-------NKTITIPDLLYLLKNKYPDVDLNKSHINRIIKDN-NITLKITRIRHEPVKRFG
HMa-1               ------------------------------------------------------------------------------------------------------------
ROr-1               LGINPRTAMRWWKHYQETGKVAYKKLQRNPGRPNSLTPEHEQHLQQIVEK-------DSQLCADDIIDSIKSQFEDIKILKSQMNHHLRNNILLSIKKPTYDPMTR----
ROr-2               ------------------------------------------------------------------------------------------------------------
MCi-1               MGRSESAIYALFKRENDDS--SEEN-KNPVGRPQEYTERDKRLAVRYAKK-------NRRASLSEIANAGYKKV-GKGVVRRAIYEAGLHK-RVAIKKPYLRIEQV----
SMAR30              SGINKYTAASLLKRYKNDGCLILQK-KRGGKRTAKITSEIMSAIEDIVEQ-------NPAITLKSISKKIMDEK-HINLTTTSINNALKRL-RITLKTATLNLDRL----
Mariner-2_MLP       LHHPRPTVYTVISKEKRTN--TFSS-SKASGRPKKLTDQDRRSIVRQAKK-------DRRAPLANIASNLPTQV-GCTTVRSEIHKLGFHS-CVAVAKPYLTPSHI----
Mariner-1_PGr       FGTARSTLSGIINRWKDRG--TNES-KPPTGRPPLTTERDERRIRQVLDD-------QRRAPMREIVEQLATPI-SIRTARRRAHKLGYQN-RRAVKKPFVNDKQA----
IS630               LCCARSSVGRWINWFTQSGVEGLKS-LPAGRARRWPFEHICTLIRELVKHSPGDFGYQRSRWSTELLAIKINEITGCQINAGTVRRWLPSA-GIVWRRAAPTLRIR----
ISSoc15             FMVTKRTVHRWVRQYQQTQ--DLAP-KKAGTKRVGILEQHRQEVMAIITE-------HPDFYLWQYQELIRERL-GINVSIVTLHNFLKKQ-GMTLKKKTYRSAKV----

                   230       240       250       260       270       280       290       300       310       320       330
                    ....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|
PUl-1               ----DRARQQVFLANLPRDS---TKSWIAL-DEAAFFLNHSRKYAWSKRGTPAVVD----RPSNR-GRMHS-LILTTSPDGVVDWRLIQGS-VDSLR-------------
PUl-2               ----DLARQKEFLSTLSQHA---NKHWIAL-DEAAFFLNHSRKYAWSERGKPAVVR----KPGRR-GKMYS-LILATSPEGVIKWRLVQGS-INSTR-------------
PGv-1               KDIDINANIKKFYEELKKYK---LEDITCI-DETSIKSLQKRHHCYSEKGKRCVIK----TQSQEVFKKYT-GIFAISVNGVEGWDLYEKSGINSDR-------------
HMa-1               ---------------------------------KYKWSSKRHQCYSELGKRCVIK----TQSQEVFKKYT-GIFAISYNGVLGWDLYEKDGINSDR-------------
ROr-1               NSDNNLQTRYEWFMKWKGSDLGYTKNCVFI-DEAAKQKKKESLQESKGRAGDIMIE----EPTIE-------YVDVEESTAIENNKSVAKG-TTTAH-------------
ROr-2               ------------------------------------------------------------------------------------------------------------
MCi-1               ------RSRRAFAEECKGWTMEQWKKVIWT-DEASFELRKPYTRITVWRTCDKAYKKECHSYHEPFTLRMHGNFMLFSMQHVLGKTLHTRSLQDQIRKSTQRHXXRGIFR
SMAR30              NSPSTILQRKEYALNFSLNAPIIREKIVFI-DESGFNCHLRRTKARSKINTGAHVI----IPTLR-GRNVS-LIAAMNLHGIVHKQIIANSTVNANV-------------
Mariner-2_MLP       ------TKRLKFAKKHKNWTVDDWKKVIWT-DESSFEIGKNSRQVQVWRKAGEKYNKDCLTPTFKSGRSSTMIWGAFIANSRLDMIFMEPGKQTGSD-------------
Mariner-1_PGr       ------ARRLAFATAHLNWTVDDWRSVIWT-DESSFELGKNSKAISVWRQTDEKYRPECLEPTFRSGRSSTMIWGGFFDKTKAPVLFMPPGQRNAAS-------------
IS630               ----DPHKDEKMAAIHKALDECSAEHPVFYEDEVDIHLNPKIGADWQLRGQQKRVV----TP----GQNEKYYLAGALHSGTGKVSCVGGNSKSSAL-------------
ISSoc15             KEEEVQRERLAYSQEVRNIP---AEDLIAI-DQTGVWEGMERRVSRSLRGQRAYHY----RQRYK-GEKYT-VLGAISLRGVVGCRVIKGG-MKKGD-------------

                   340       350       360       370       380       390       400       410       420       430       440
                    ....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|....|
PUl-1               --FHAFL--SGL---------PGDTNVLLD-------------------------------------------------NCATHHASHVLVKQGKTTVSQVARSK-QMTLN
PUl-2               --FHSFL--SEL---------PNDTNVLLD-------------------------------------------------NVSTHKATHSLRKQDLSTIPEVAESK-RINML
PGv-1               --LVEFL--EKHIT-----ENYKNKLIILD-------------------------------------------------NASSHRNQRI--K-------DLV-NK-HNNIL
HMa-1               --LYEFL--EKHITKK-IQKKYKNKLIFLD-------------------------------------------------NASSHRNEKI--K-------ELL-NK-HNTLL
ROr-1               --FVRFI--SEILDIMNMDESLMGSYLVMG-------------------------------------------------YCNIHKSHPM--I-------RKIESR-GYRVM
ROr-2               --YYNFI--ANALDILYQXEXLKSSYIVMD-------------------------------------------------NAPIHKNADIRKQ-------KIIEQR-GYGCV
MCi-1               LIFHAIFTINXILGRLLTLGQHNTKFIFKDRXTTEPRWPFVCHHYHILINQXQDDLARSHSIICLFDFCQKKKKKGINTMVFHSIFFKSN-------TLFYTN-ISRIL
SMAR30              --FINFL--DGLFQTL-REANITCAWLVLD-------------------------------------------------NCTIHKTQEV--R-------DKVGTT-SHTLV
Mariner-2_MLP       --FVKQVYEGSLGPFLNSPTTPSGLILMED-------------------------------------------------GAPVHRCKVA--Q-------SWRDMH-PISKL
Mariner-1_PGr       --FIENVYEKGLQPFMDGIDEAHRPTLMED-------------------------------------------------NAPVHTAILS--R-------NYRASH-GIKKI
IS630               --FISLL--KRLKA---TYRRAKTITLIVD-------------------------------------------------NYIIHKSRET--Q-------SWLKENPKFRVI
ISSoc15             --FLEFL--RSEL----CPKLDARKVVIMD-------------------------------------------------NLNIHKSREV--E-------ELIRGT-GARIL

                   450       460       470       480       490       500       510       520
                    ....|....|....|....|....|....|....|....|....|....|....|....|....|....|..
PUl-1               -YLPPYSPQLNPVELCFNLIRTHVNRT--APRTLGSLHKCIQTAIRGLTPAVCRSMFRKCLLIG------------------
PUl-2               -YLPPYSPQLNPVELCFNFIRTSVNGS--APRTLESLRSSIQTAIEALTPSVCRSMFARTLKICRL-----------------
PGv-1               -YAVPYQHFTNSIENYFSMLKSRLQKL--DGLTHTKLKENIENVISKIPKDKYKNIFKGAYERPEKYIPK-NKTRKVKKDYL
HMa-1               -YSVPYQHFTNSIENYFSMMKSRLQKL--DGLTHKELKTNIKKVIKDIPKEKYENIIKGTYNRTEKYHKKLSNRRKTLKNYF
ROr-1               -YLPPCSPELNPIEQ-----------------------------------------------------------------
ROr-2               -YLPAYSPELNPIGQFXSVCKSKLKRK--ELLQEETLSSRSEDACNRILLSDLQGFCRYSAARFEDCLNR---------KPM
MCi-1               -LLP--SPILXGTYKHCCNLRST---------------------------------------------------------
SMAR30              -YLPPYSPMLNPIEKVFSKTKLCARNLLAESRTDLNLENVIQESLATVTQSDCNNYYVDMTMKLPLA--------TGGQPLH
Mariner-2_MLP       -EWPANSPDLNPIENIRRDMKMAVSTK-HQPRTVSEMKTVLNLEWNSIPDSKLESLVASMPARMQAVIEA-----KGGHTKW
Mariner-1_PGr       DNWPAQSPDLNPIENVWKDLKVAIQTL-YNPRSIPELKEAISQAWDDYPTQTFDHLLESMPHRMKAVVDA-----DGGPTRW
IS630               -YQPVYSPWVNHVERLWQALHDTITRN-HQCSSMWQLLKKVRHFMETVSP---------------------FPGGKHGLAKV
ISSoc15             -YLPVYAPPLNPIEMMWSVLKHFIRQL--CRIGKYSMEQIVKTSLLLINPSSFRSWFAKCCYCTP-----------------
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