

Р†РќРЎРЎР РЈРЉРІР†РЇ

**PrP»CЦ PjPμPrPëC‡PSPsPiPs P•P°CíC,PsCíCíPIP°PSPSCЦ P»C-PεP°CђCíCђPεPsPiPs
P•P°CíPsP±Cí**

PjPμPjPsPεCΓ 10

(MEMPHIS 10)

PjPμPjPsPεCΓ 20

(MEMPHIS 20)

$P\check{Y}P\in P\gg P^{\circ}P\Gamma$:

$$PrC-C\bar{H}C\neq P^\circ \quad C\bar{H}P_\mu C\neq PsPIP\ddot{e}PSP^\circ: P_jP_\mu P_jP^\circ PSC, P\ddot{e}PS;$$

1 C,P°P±P»PµC,PeP° PjC-ClC,PeC,CH PjPµPjP°PSC,PePSCr PiC-PrCHjPsC...P»PsCHjPëPrCr 10 PjPi
P°P±Ps 20 PjPi;

*PrPsPiPsPjC-P¶PSC- CḤPμC‡PsPIPëPSPë: P»P°PeC,PsP·Pë PjPsPSPsPiC-PrCḤP°C,,
C‡PμP»CḤP»PsP·P° PjC-PeCḤPsPeCḤPëCḤC, P°P»C-C‡PSP°, C,P°P»CḤPe, PeCḤPμPjPSC-CḤ
PrC-PsPeCḤPëPr PePsP»PsC—PrPSPëPμ P±PμP·PiPsPrPSPëPμ, PjP°PiPSC-CḤ CḤC,PμP°CḤP°C,;*

$C\acute{I}C\acute{z}PjC-C\epsilon$ $PrP\rangle C\downarrow$ $PiP\rangle C-PIPePsPIPsPiPs$ $PiPsPeC\overline{H}P\ddot{e}C,C,C\downarrow$: $P\rangle P^{\circ}PeC,PsP\cdot P\ddot{e}$
 $PjPsPSPsPiC-PrC\overline{H}P^{\circ}C,,$ $PiC-PiC\overline{H}PsPjP\mu P\rangle PsP\cdot P^{\circ},$ $C,P\ddot{e}C,P^{\circ}PSC\acute{r}$ $PrC-PsPeC\acute{I}P\ddot{e}Pr$ (E 171),
 $PiPsP\rangle C-P\mu C,P\ddot{e}P\rangle P\mu PSPiP\rangle C-PePsP\rangle CH$ 4000 ($PjP^{\circ}PeC\overline{H}PsPiPsP\rangle$), $PrP\rangle C\downarrow$ $C,P^{\circ}P\pm P\rangle P\mu C,PsPe$
 20 $PjPi:$ $P\cdot P^{\circ}P\rangle C-P\cdot P^{\circ}$ $PsPeC\acute{I}P\ddot{e}Pr$ $P\overline{H}PsPIC,P\ddot{e}PN_{\infty}$ (E 172), $P\cdot P^{\circ}P\rangle C-P\cdot P^{\circ}$ $PsPeC\acute{I}P\ddot{e}Pr$
 $C\ddagger P\mu C\overline{H}PIPsPSP\ddot{e}PN_{\infty}$ (E 172).

P>C-PeP°C₇C₇HC₇PeP° C,,PsC₇PjP°. P₇P°P±P»P_μC,PePë, PIPeC₇PëC,C-PiP»C-PIPePsPIP₇C₇ PsP±PsP»PsPSPePsC₇.

$$Ph\dot{C}IPSPsPIPSC-C_{\text{„}}C-P\ddot{P}ePePs-C...C-PjC-C\ddot{P}SC-PIP\gg P^{\circ}C\dot{I}C,P\ddot{e}PIPsC\dot{I}C,C-:$$

B«PҺPμPjPsPeCГ 10B»: C,P°P±P»PμC,PePë PeCГCrPiP»PsC— C„PsCГPjPë P·
PrPIPsPsPiCrPeP»PsCГ PiPsPIPμCГC...PSPμCГ, PIPECГPëC,C- PsP±PsP»PsPSPePsCГ
P±C-P»PsPiPs PePsP»CHbpsCГCr, P· PiCГP°PIC-CГCrPIP°PSPSCГPj B«M9MNB» C- B«10B» P·
PsPrPSPSPiPs P±PsPeCr C- CГPëCГPePsCГ вГ“ P· C-PSC€PsPiPs;

B«PҺPμPjPsPeCГ 20B»: C,P°P±P»PμC,PePө PsPIP°P»CHΨSPSс— C„PsCГPjPө P·
PrPIPsPsPiCrPeP»PsCГ PiPsPIPμCГC...PSPμCГ, PIPeCГPөC,C- PsP±PsP»PsPSPePsCГ
C‡PμCГPIPsPSPs-PePsCГPөC‡PSPμPIPsPiPs PePsP»CHΨPsCГCr, P· PiCГP°PIC-CГCrPIP°PSPSCГPj
B«M9MN 20B» P· PsPrPSPsPiPs P±PsPeCr C- CГPөCГPePsCГ вГ“ P· C-PSC€PsPiPs.

$$P'C-PsC,C\bar{H}P^{\circ}PSC\bar{I}'C,,PsC\bar{H}PjP^{\circ}C\bar{I}'C-C\bar{H}.$$

P'P»PëP·CHPePs 80 % C†PëCĤPeCfP»CHCHC†PëC... PI PsCĤPiP°PSC-P·PjC- P»CHPrPëPSPë
CfPiPsCĤC-PrPSPµPSPëC... P· PjPµPjP°PSC,PëPSPsPj PiC-PrCĤPsC...P»PsCĤPëPrPsPj
CfPiPsP»CfPe PiCĤPëCfCfC,PSC- Cf PIPëPiP»CĤPrC- PiPsC†P°C,PePsPIPsC—
CĤPµC†PsPIPëPSPë. PhCfPSPsPIPsPëPjPë PjPµC,P°P±PsP»C-C,P°PjPë PI P»CHPrPëPSPë
C" B B B B B B B B B

B N-3,5-PrPëPjPµC,PëP»-PiP»CfPrP°PSC,P°PS, C-P·PsPjPµCĤPSP° CfCfPjC-C€ 4- C- 6-
PiC-PrCĤPsPeCfPëPjPµPjP°PSC,PëPSCf, P° C,P°PePsP¶ 1-PSC-C,CĤPsP·Ps-B B B B B B

3,5-PrPëPjPµC,PëP»P°PrP°PjP°PSC,P°PS. P-PsPrPµPS C-P· C†PëC... PjPµC,P°P±PsP»C-C,C-PI
PSPµ PiCĤPsCĤPIP»CĤC" P°PSC,P°PiPsPSC-CfC,PëC†PSPsC— PrC-C— PIC-PrPSPsCfPSPs
NMDA-CĤPµC†PµPiC,PsCĤC-PI. PjC†P°CfC,C- C†PëC,PsC...CĤPsPjCf P 450 Cf
PjPµC,P°P±PsP»C-P·PjC- *in vitro* PSPµ PIPëCĤPIP»PµPSPs. Pj PrPsCfP»C-PrP¶PµPSPSC- PiCĤPë
PiPµCĤPsCĤP°P»CHPSPsPjCf P·P°CfC,PsCfCfPIP°PSPSC- ¹⁴C-PjPµPjP°PSC,PëPSCf PI
CfPµCĤPµPrPSCĤPsPjCf 84 % PrPsP·Pë P±CfP»Ps PµP»C-PjC-PSPsPIP°PSPs PiCĤPsC,CĤPiPsPj
20 PrPSC-PI, P±C-P»CHC€Pµ 99 % PrPsP·Pë P±CfP»Ps PIPëPiPµPrPµPSPs PSPëCĤPeP°PjPë.

P·P»C-PjC-PSP°C†C-CĤ.

PĤPµPjP°PSC,PëPS PµP»C-PjC-PSCfC"C,CHCfCĤ P·P° PeCĤPëPIPsCĤ
PjPsPSPsPµPeCfPiPsPSPµPSC†C-P°P»CHPSPsC— P·P°P»PµP¶PSPsCfC,C- C-P·
PiCĤPsPjC-P¶PePsPj t_{1/2} PiPµCĤC-PsPr PSP°PiC-PIPIPëPiPµPrPµPSPSCĤ PIC-Pr 60 PrPs 100
PiPsPrPëPS. Pj P»CHPrPµPNë P· PSPsCĤPjP°P»CHPSPsCĤ C,,CfPSPeC†C-C"CĤ PSPëCĤPsPe
P·P°PiP°P»CHPSPëPNë PeP»C-CĤPµPSCf (Cl_{tot}) CfC,P°PSPsPIPëC,CH 170 PjP»/C...PI/1,73 Pj².
PëPëCĤPePsPIP° CfC,P°PrC-CĤ C,,P°CĤPjP°PePsPeC-PSPµC,PëPePë PjPµPjP°PSC,PëPSCf
PIPeP»CHC†P°C" C,P°PePsP¶ PeP°PSP°P»CHC†PµPICf CĤPµP°P±CfPsCĤP±C†C-CĤ.

PëPIPëPrPeC-CfC,CH PSPëCĤPePsPIPsC— PµP»C-PjC-PSP°C†C-C— PjPµPjP°PSC,PëPSCf PI
CfPjPsPIP°C... P»CfP¶PSPsC— CĤPµP°PeC†C-C— CfPµC†C- PjPsP¶Pµ P·PSPëP¶CfPIP°C,PëCfCĤ
Cf 7-9 CĤP°P·C-PI. PhP»CfP¶PSPµPSPSCĤ CfPµC†C- PjPsP¶Pµ PIC-PrP±CfPIP°C,PëCfCĤ Cf
CĤPµP·CfP»CHC,P°C,C- CfCfC,C,C"PIPëC... P·PjC-PS PrC-C"C,Pë, PSP°PiCĤPëPeP»P°Pr
P·P°PjC-PSPë P±P°PiP°C,PsPiPs PSP° PjBĤ™ CĤCfPSC- CfC,CĤP°PIPë CĤP°C†C-PsPSCf
PIPµPiPµC,P°CĤC-P°PSCfCHPePëPj P°P±Ps PIPSP°CfP»C-PrPsPe C-PSC,PµPSCfPëPIPsPiPs
PiCĤPëPNëPsPjCf P°PSC,P°C†PëPrPSPëC... C€P»CfPSPePsPIPëC... P·P°CfPsP±C-PI.

P>C-PSC-PNëPSC-CfC,CH.

PαP°CĤPjP°PePsPeC-PSPµC,PëPeP° PjP°C" P»C-PSC-PNëPSPëPNë C...P°CĤP°PeC,PµCĤ Cf
PrC-P°PiP°P·PsPSC- PrPsP· 10-40 PjPi.

*PαP°CĤPjP°PePsPrPëPSP°PjC-C†PSPëPNë/C,,P°CĤPjP°PePsPeC-PSPµC,PëC†PSPëPNë
P·PIBĤ™ CĤP·PsPe.*

PµCĤPë PrPsP·C- PjPµPjP°PSC,PëPSCf 20 PjPi PSP° PrPsP±Cf CĤC-PIPµPSCĤ PIPjC-CfC,Cf Cf
C†PµCĤPµP±CĤPsCfPiC-PSP°P»CHPSC-PNë CĤC-PrPëPSC- PIC-PrPiPsPIC-PrP°C"
PIPµP»PëC†PëPSC- k_i (PePsPSCfC,P°PSC,P° PiP°P»CHPjCfPIP°PSPSCĤ) PjPµPjP°PSC,PëPSCf,
C%Ps CfC,P°PSPsPIPëC,CH 0,5 PjPePjPsP»CH Cf PrC-P»CĤPSC†C- C,,CĤPsPSC,P°P»CHPSPsC—
PePsCĤPë PiPsP»PsPIPsPiPs PjPsP·PeCf P»CHPrPëPSPë.

PљP»C-PSC-C†PSC- C...P°CĤP°PeC,PµCĤPëCfC,PëPePë.

PuPsPeP°P·P°PSPSCII.

PΓPIPsCḡPsP±P° PhP»CHC†PiPuPNḡPjPuCḡP° PIC-Pr P»PuPiPePsPiPs CΓC,CrPiPuPSCII PrPs C,CIIPIPePëC... C,,PsCḡPj.

PuCḡPsC,PëPiPsPeP°P·P°PSPSCII.

P“C-PiPuCḡC†CrC,P»PëPIC-CΓC,CH PrPs PrC-CHC†PsC— CḡPuC†PsPIPëPSPë P°P±Ps PrPs P±CrPrCH-CIIPIPePsPiPs PePsPjPiPsPSPuPSC,P° PiCḡPuPiP°CḡP°C,Cr.

P'P·P°C" PjPsPrC-CII P· C-PSC€PëPjPë P»C-PeP°CḡCΓCHPePëPjPë P·P°CΓPsP±P°PjPë C,P° C-PSC€C- PIPëPrPë PIP·P°C" PjPsPrC-PNḡ.

P— PsPiP»CIIPICr PSP° C,,P°CḡPjP°PePsP»PsPiC-C†PSC- PuC,,PuPeC,Pë C,P° PjPuC...P°PSC-P·Pj PrC-C— PjPuPjP°PSC,PëPSCr PiC-PrCḡPsC...P»PsCḡPëPrCr PjPsP¶CrC,CH CΓPiPsCΓC,PuCḡC-PiP°C,PëCΓCII PSP°CΓC,CrPiPSC- CḡPuP°PeC†C-C— PIP·P°C" PjPsPrC-C—:

-B CΓP»C-Pr CrPSPëPeP°C,Pë PsPrPSPsC†P°CΓPSPsPiPs P·P°CΓC,PsCΓCrPIP°PSPSCII PjPuPjP°PSC,PëPSCr C,P° P°PjP°PSC,P°PrPëPSCr C†PuCḡPuP· CḡPëP·PëPe C,,P°CḡPjP°PePsC,PsPeCΓPëC†PSPsPiPs PiCΓPëC...Ps·Cr. PhP±PëPrPIC- CΓPiPsP»CrPePë C" C...C-PjC-C†PSPs PiPsPiBḡ™ CIIPI·P°PSPëPjPë NMDA-P°PSC,P°PiPsPSC-CΓC,P°PjPë. PŷPu P¶ CΓP°PjPu PjPsP¶Pu CΓC,PsCΓCrPIP°C,PëCΓCII PePuC,P°PjC-PSCr C- PrPuPeCΓC,CḡPsPjPuC,PsCḡC,,P°PSCr. P' PsPrPSPsPjCr PsPiCrP±P»C-PePsPIP°PSPsPjCr P·PIC-C,C- P·P°P·PSP°C†P°P»PsCΓCII C,P°PePsP¶ PiCḡPs PjPsP¶P»PëPIPëPNḡ CḡPëP·PëPe PePsPjP±C-PSP°C†C-C— PjPuPjP°PSC,PëPSCr PNḡ C,,PuPSC-C,PsC—PSCr;

- PjPuC...P°PSC-P·Pj PrC-C— PiPuCḡPuPrP±P°C†P°C" PjPsP¶P»PëPIPu PiPsCΓPëP»PuPSPSCII PuC,,PuPeC,C-PI L-PrPsPiP°, PrPsPiP°PjC-PSPuCḡPiC-C†PSPëC... P°PiPsPSC-CΓC,C-PI C,P° P°PSC,PëC...PsP»C-PSPuCḡPiC-C†PSPëC... P·P°CΓPsP±C-PI PiCḡPë PsPrPSPsC†P°CΓPSPsPjCr P·P°CΓC,PsCΓCrPIP°PSPSC- C,P°PePëC... NMDA-P°PSC,P°PiPsPSC-CΓC,C-PI, CIIPIe PjPuPjP°PSC,PëPS. PhPsP¶P»PëPIPu PiPsCΓP»P°P±P»PuPSPSCII PuC,,PuPeC,C-PI P±P°CḡP±C-C,CrCḡP°C,C-PI C,P° PSPuPNḡCḡPsP»PuPiC,PëC†PSPëC... P·P°CΓPsP±C-PI. PŷCrPjC-CΓPSPu PiCḡPëP·PSP°C†PuPSPSCII PjPuPjP°PSC,PëPSCr C,P° CΓPiP°P·PjPsP»C-C,PëC†PSPëC... P·P°CΓPsP±C-PI, PrP°PSC,CḡPsP»PuPSCr P°P±Ps P±P°PeP»PsC,,PuPSCr PjPsP¶Pu PjPsPrPëC,,C-PeCrPIP°C,Pë C—C... PuC,,PuPeC,Pë, C%Ps PjPsP¶Pu PsP±CrPjPsPIPëC,Pë PSPuPsP±C...C-PrPSC-CΓC,CH PePsCḡPuPeC†C-C— PrPsP·;

-B C-PSC€C- P»C-PeP°CḡCΓCHPeC- P·P°CΓPsP±Pë, C,P°PeC- CIIPIe C†PëPjPuC,PëPrPëPS, CḡP°PSC-C,PëPrPëPS, PiCḡPsPeP°C—PSP°PjC-Pr, C...C-PSC-PrPëPS, C...C-PSC-PS C,P° PSC-PePsC,PëPS, CIIPIeC- PIPëPePsCḡPëCΓC,PsPICrCḡC,CH C,Cr P¶ PeP°C,C-PsPSPSCr C,CḡP°PSCΓPiPsCḡC,PSCr CΓPëCΓC,PuPjCr PSPëCḡPsPe, C%Ps PNḡ P°PjP°PSC,P°PrPëPS, PjPsP¶P»PëPIPs, C,P°PePsP¶ P·PrP°C,PSC- PIP·P°C" PjPsPrC-CIIPI,C P· PjPuPjP°PSC,PëPSPsPj, PsP±CrPjPsPIP»CḡCḡC†Pë PiPsC,PuPSC†C-PNḡPSPëPNḡ CḡPëP·PëPe PiC-PrPIPëC%PuPSPSCII CḡC-PIPSC-PI PIPjC-CΓC,Cr C†PëC... PiCḡPuPiP°CḡP°C,C-PI Cr PiP»P°P·PjC- PeCḡPsPIC-;

- PiCḡPë CΓCrPjC-CΓPSPsPjCr PiCḡPëP·PSP°C†PuPSPSC- PjPuPjP°PSC,PëPSCr P· PiC-PrCḡPsC...P»PsCḡPsC,C-P°P·PëPrPsPj C†Pë P±CrPrCH-CIIPIePëPj PePsPjP±C-PSPsPIP°PSPëPj PiCḡPuPiP°CḡP°C,PsPj, CIIPIePëPNḡ PjC-CΓC,PëC,CH PiC-PrCḡPsC...P»PsCḡPsC,C-P°P·PëPr, PjPsP¶P»PëPIPu P·PSPëP¶PuPSPSCII CḡC-PIPSCII

PIPJc-CÍ'C,Cr PsCÍ'C,P°PSPSCHbPsPiPs Cr CÍ'PëCĤPsPIP°C,C†C- PeCĤPsPIC-;

-B P±CfP»Pë PiPsPIC-PrPsPjP»PμPSPSCĬ PiCĤPs PsPeCĤPμPjC- PIPëPiP°PrPePë
PiC-PrPIPëC%oPμPSPSCĬ PjC-P¶PSP°CĤPsPrPSPsPiPs PSPsCĤPjP°P»C-P·PsPIP°PSPsPiPs
CÍ'PiC-PIPIC-PrPSPsC€PμPSPSCĬ (PĤPĤPŸ) PiCĤPë P·P°CÍ'C,PsCÍ'CrPIP°PSPSC-
PjPμPjP°PSC,PëPSCr PiP°C†C-C"°PSC,P°Pj, CĬPeC- PiCĤPëPNëPjP°CĤC,Ch PIP°CĤC,,P°CĤPëPS.
P¶PsC†P° PiCĤPëC†PëPSPSPëPNë P·PiBĤ™ CĬP·PsPe PSPμ PICÍ'C,P°PSPsPIP»PμPSPëPNë,
PSPμPsP±C...C-PrPSPëPNë CĤPμC,PμP»CHbPSPëPNë PjPsPSC-C,PsCĤPëPSPi
PiCĤPsC,CĤPsPjP±C-PSPsPiPsPiPs C†P°CÍ'Cr P°P±Ps PĤPĤPŸ Cr PiP°C†C-C"°PSC,C-PI, CĬPeC-
PsPrPSPsC†P°CÍ'PSPs PiCĤPëPNëPjP°CĤC,Ch PiPμCĤPsCĤP°P»CHbPSC-
P°PSC,PëPePsP°PiCfP»CĬPSC,Pë.

PJ C...PsPrC- C,,P°CĤPjP°PePsPeC-PSPμC,PëC†PSPëC... PrPsCÍ'P»C-PrP¶PμPSCĤ
PsPrPSPsCĤP°P·PsPIPëC... PrPsP· Cr PjPsP»PsPrPëC... P·PrPsCĤPsPIPëC...
PrPsP±CĤPsPiPsP»CHbC†C-PI CÍ'CrC,C,C"°PIPëC... PμC,,PμPeC,C-PI PIP·P°C"°PjPsPrC-C—
PjPμPjP°PSC,PëPSCr P· PiP»C-P±CfCĤPëPrPsPj/PjPμC,C,,PsCĤPjC-PSPsPj,
PrPsPSPμPiPμP·PëP»PsPj PSPμ PIPëCĬPIP»PμPSPs.

P'C-PrPiPsPIC-PrPSPs PrPs PSP°CĬPIIPSPëC... PrP°PSPëC... PeP»C-PSC-C†PSPëC...
PrPsCÍ'P»C-PrP¶PμPSCĤ Cr PjPsP»PsPrPëC... P·PrPsCĤPsPIPëC... PrPsP±CĤPsPiPsP»CHbC†C-PI
PSPμ CÍ'PiPsCÍ'C,PμCĤC-PiP°P»Pë P·PSP°C†CfC%oPsPiPs PIPiP»PëPICr PjPμPjP°PSC,PëPSCr
PiC-PrCĤPsC...P»PsCĤPëPrCr PSP° C,,P°CĤPjP°PePsPeC-PSPμC,PëPeCr PiP°P»P°PSC,P°PjC-PSCr.
PĤPμPjP°PSC,PëPS *in vitro* PSPμ C" C-PSPiC-P±C-C,PsCĤPsPj PŸYP 1Pĥ2, 2Pĥ6, 2PŸ9,
2D6, 2P·1, 3Pĥ, C,,P»P°PIC-PSPIPjC-CÍ'PSPsC— PjPsPSPsPsPeCÍ'PëPiPμPSP°P·Pë,
PμPiPsPeCÍ'PëPrPiC-PrCĤPsP»P°P·Pë P°P±Ps CÍ'CrP»CHbC,,P°C,C-PsPSCr.

PĤCÍ'PsP±P»PëPIPsCÍ'C,C- P·P°CÍ'C,PsCÍ'C¿PIP°PSPSCĬ.

PŸP»C-Pr PrPsC,CĤPëPjCfPIP°C,PëCÍ'CĬ PsP±PμCĤPμP¶PSPsCÍ'C,C-, PiCĤPëP·PSP°C†P°CĤC†Pë
PiCĤPμPiP°CĤP°C, C...PIPsCĤPëPj PSP° PμPiC-P»PμPiCÍ'C-CH, PiP°C†C-C"°PSC,P°Pj P·
PμPiC-P·PsPrP°PjPë CÍ'CrPrPsPj PI P°PSP°PjPSPμP·C-, P° C,P°PePsP¶ PiP°C†C-C"°PSC,P°Pj C-P·
C,,P°PeC,PsCĤP°PjPë CĤPëP·PëPeCr CĤPsP·PIPëC,PeCr PμPiC-P»PμPiCÍ'C-C—.

PŸP»C-Pr CrPSPëPeP°C,Pë PsPrPSPsC†P°CÍ'PSPsPiPs P·P°CÍ'C,PsCÍ'CrPIP°PSPSCĬ
PiCĤPμPiP°CĤP°C,Cr P· C,P°PePëPjPë (NMDA)-P°PSC,P°PiPsPSC-CÍ'C,P°PjPë, CĬPe
P°PjP°PSC,P°PrPëPS, PePμC,P°PjC-PS C,P° PrPμPeCÍ'C,CĤPsPjPμC,PsCĤC,,P°PS. PiC-
CÍ'PiPsP»CfPePë PIPiP»PëPIP°CĤC,Ch PSP° PsPrPSCr PNë C,Cr P¶ CÍ'P°PjCf CÍ'PëCÍ'C,PμPjCf
CĤPμC†PμPiC,PsCĤC-PI, C%oPs PNë PjPμPjP°PSC,PëPS, P° C,PsPjCf PiPsP±C-C†PSC-
PμC,,PμPeC,Pë (PiPμCĤPμPiP°P¶PSPs PiPsPiBĤ™ CĬP·P°PSC- P· C†PμPSC,CĤP°P»CHbPSPsCĤ
PSPμCĤPIPsPiPsCĤ CÍ'PëCÍ'C,PμPjPsCĤ) PjPsP¶CfC,Ch P±CfC,Pë C†P°CÍ'C,C-C€PëPjPë C†Pë
PIPëCĤP°P¶PμPSC-C€PëPjPë.

P"°PμCĬPeC- C,,P°PeC,PsCĤPë, C%oPs CÍ'PiCĤPëC†PëPSCĬCĤC,Ch PiC-PrPIPëC%oPμPSPSCĬ
CĤPĤ CÍ'PμC†C-, PjPsP¶CfC,Ch PsP±CfPjPsPIPëC,Pë PSPμPsP±C...C-PrPSC-CÍ'C,Ch
CĤPμC,PμP»CHbPSPsPiPs PSP°PiP»CĬPrCr P·P° PiP°C†C-C"°PSC,PsPj. P°PeP·P·P°PSC-
C,,P°PeC,PsCĤPë PIPeP»CĤC†P°CĤC,Ch CÍ'CrC,C,C"°PIC- P·PjC-PSPë PrC-C"°C,Pë,
PSP°PiCĤPëPeP»P°Pr P·P°PjC-PSCr P±P°PiP°C,PsPiPs PSP° PjBĤ™ CĬCÍ'PSC- CÍ'C,CĤP°PIPë
CĤP°C†C-PsPSCr PSP° PIPμPiPμC,P°CĤC-P°PSCÍ'CHbPePëPNë P°P±Ps P¶
C-PSC,PμPSCÍ'PëPIIPSPëPNë PiCĤPëPNëPsPj P°PSC,P°C†PëPrPSPëC... C€P»CfPSPePsPIPëC...
P·P°CÍ'PsP±C-PI. PĤCĤC-Pj C,PsPiPs, CĤPĤ CÍ'PμC†C- PjPsP¶Pμ PiC-PrPIPëC%oCrPIP°C,PëCÍ'CĬ

C†PμCḡPμP· CÍC,P°PSPë C,CrP±CÍP»C¼CḡPSPsPiPs PSPëCḡPePsPIPsPiPs P°C†PëPrPsP·CÍ C†Pë
PIPSP°CÍP»C-PrPsPe C,C¼P¶PePëC... C-PSC,,PμPeC†C-PNë CÍPμC†PsPIPsPiPs C,CḡP°PeC,CÍ,
CÍPiCḡPëC†PëPSPμPSPëC... *Proteus bacteria*.

P†CÍPSCrCḡC,CH P»PëC€Pμ PsP±PjPμP¶PμPSC- PrP°PSC- C%PsPrPs PiP°C†C-C" PSC,C-PI,
C¼PeC- PSPμC%PsPrP°PIPsPs PiPμCḡPμPSPμCÍP»Pë C-PSC,,P°CḡPeC, PjC-PsPeP°CḡPrP°,
PiP°C†C-C" PSC,C-PI C-P· PrPμPePsPjPiPμPSCÍPsPIP°PSPsCḡ P·P°CÍC,C-PNëPSPsCḡ
CÍPμCḡC†PμPIPsCḡ PSPμPrPsCÍC,P°C,PSC-CÍC,Cḡ (P†P†P†-IV CÍC,CrPiPμPSC¼ P·PiC-PrPSPs P·
PeP»P°CÍPëC,,C-PeP°C†C-C" Cḡ PκCHCḡ-P™ PsCḡPeCÍCḡPePsC—
PeP°CḡPrC-PsP»PsPiC-C†PSPsC— P°CÍPsC†C-P°C†C-C—), P° C,P°PePsP¶ C-P·
PSPμPePsPSC,CḡPsP»CHPsPIP°PSPsCḡ P°CḡC,PμCḡC-P°P»CHPSPsCḡ
PiC-PiPμCḡC,PμPSP·C-C" Cḡ. PÿPsPjCÍ P·P° PiP°C†C-C" PSC,P°PjPë P· C,P°PePëPjPë
P·P°C...PIPsCḡCḡPIP°PSPSC¼PjPë PSPμPsP±C...C-PrPSPëPNë CḡPμC,PμP»CHPSPëPNë
PSP°PiP»C¼Pr.

P"Ps CÍPeP»P°PrC¿ PiCḡPμPiP°CḡP°C,C¿ PIC...PsPrPëC,CH P»P°PeC,PsP·P°, C,PsPjC¿ PNëPsPiPs
PSPμ PiPsPIPëPSPSC- PiCḡPëPNëPjP°C,Pë PiP°C†C-C" PSC,Pë P· CḡC-PrPeC-CÍPSPsCḡ
CÍPiP°PrPePsPIPsCḡ PSPμPiPμCḡPμPSPsCÍPëPjC-CÍC,Cḡ PiP°P»P°PeC,PsP·Pë,
P»P°PeC,P°P·PSPsCḡ PSPμPrPsCÍC,P°C,PSC-CÍC,Cḡ P°P±Ps PiPsCḡC¿C€PμPSPSC¼PjPë
PICÍPjPsPeC,C¿PIP°PSPSC¼ PiP»CḡPePsP·Pë-PiP°P»P°PeC,PsP·Pë.

P—P°CÍC,PsCÍC¿PIP°PSPSC¼ C¿ PiPμCḡC-PsPr PIP°PiC-C,PSPsCÍC,C- P°P±Ps
PiPsPrC¿PIP°PSPSC¼ PiCḡC¿PrPrCḡ.

P'P°PiC-C,PSC-CÍC,CH

P"°PSPëC... C%PsPrPs PIPiP»PëPICr PjPμPjP°PSC,PëPSCr PiCḡPë P·P°CÍC,PsCÍCÍPIP°PSPSC-
PNëPsPiPs CÍ PiPμCḡC-PsPr PIP°PiC-C,PSPsCÍC,C- PSPμPjP°C".

PμPsPIC-PrPsPjP»C¼P»PsCÍC¼, C%Ps PrPsCÍP»C-PrP¶PμPSPSC¼ PSP° C,PIP°CḡPëPSP°C...
PIPeP°P·CÍCḡC,CH PSP° PjPsP¶P»PëPIC-CÍC,CH CÍPiPsPIC-P»CHPSPμPSPSC¼
PIPSCrC,CḡC-C€PSCḡPsCÍC,CḡPsP±PSPsPiPs CḡPsCÍC,CÍ PiCḡPë PIPiP»PëPIC-
PePsPSC†PμPSC,CḡP°C†C-PNë, C-PrPμPSC,PëC†PSPëC... P°P±Ps PrPμC%Ps P±C-P»CHC€PëC...
PIC-Pr C,PëC..., C%Ps P·P°CÍC,PsCÍPsPICrCḡC,CHCÍC¼ PrP»C¼ P»CḡPrPëPSPë.
B PμPsC,PμPSC†C-PNëPSPëPNë CḡPëP·PëPe PrP»C¼ P»CḡPrPëPSPë PSPμPIC-PrPsPjPëPNë.
PḡPμPjP°PSC,PëPS PSPμ CÍP»C-Pr P·P°CÍC,PsCÍPsPICrPIP°C,Pë CÍ PiPμCḡC-PsPr
PIP°PiC-C,PSPsCÍC,C-, P·P° PIPëPSC¼C,PePsPj PIPëPiP°PrPeC-PI, PsP±CÍPjPsPIP»PμPSPëC...
C†C-C,PePsCḡ C,P° C¼PIPSPsCḡ PSPμPsP±C...C-PrPSC-CÍC,Cḡ.

P"PsPrCÍPIP°PSPSC¼ PiCḡCÍPrPrCḡ

PκPμPIC-PrPsPjPs, C†Pë PIC-PrP±CÍPIP°C"C,CHCÍC¼ PμPeCÍPeCḡPμC†C-C¼
PjPμPjP°PSC,PëPSCr CÍ PiCḡCÍPrPSPμ PjPsP»PsPePs, PsPrPSP°Pe, PICḡP°C...PsPICrCḡC†Pë
P»C-PiPsC,,C-P»CHPSC-CÍC,CH CÍCÍP±CÍC,P°PSC†C-C—, P¶C-PSPeP°Pj, C¼PeC-
P·P°CÍC,PsCÍPsPICrCḡC,CH PjPμPjP°PSC,PëPS, CÍP»C-Pr CÍC,CḡPëPjP°C,PëCÍC¼ PIC-Pr
PiPsPrCÍPIP°PSPSC¼ PiCḡCÍPrPrCḡ.

PμPμCḡC,PëP»CHPSC-CÍC,CH

PμPsP±C-C†PSPëPNë PIPiP»PëPI PjPμPjP°PSC,PëPSCr PSP° CḡPμPiCḡPsPrCÍPeC,PëPIPSCr

C,,CfPSPeC†C-CH C‡PsP»PsPIC-PeC-PI C,P° P¶C-PSPsPe PSPµ PIC-PrP·PSP°C‡P°PIC†C¶.

*P—PrP°C,PSC—C†C,CH PIPiP»PēPIP°C,Pē PSP° CēPIPēPrPeC—C†C,CH C¶PµP°PeC†C— PīC¶Pē
PePµC¶C‡PIP°PSPSC- P°PIC,PsC,C¶P°PSC†PisC¶C,PsPj P°P±Ps C-PSCēPēPjPē
PjPµC...P°PSC-P·PjP°PjPē.*

PIPIPsC¶PSP±P° PhP»CHC†PiPµPNēPjPµC¶P° PIC-Pr C†PµC¶PµPrPSCHPsPiPs C†C,C†PiPµPSC¶
PrPs C,C¶P¶PePēC... C,,PsC¶Pj P·P°P·PIPēC‡P°PNē P·C†PjPsPIP»CHC” PiPsPiC-C¶CēPµPSPSC¶
P·PrP°C,PSPsC†C,C- PePµC¶C†PIP°C,Pē P°PIC,PsPjPsP±C-P»PµPj C,P° PīC¶P°C†CHPIP°C,Pē P·
C-PSCēPēPjPē PjPµC...P°PSC-P·PjP°PjPē. P·C-P»CHCē C,PsPiPs, PjPµPjP°PSC,PēPS PjP°C”
PSPµP·PSP°C‡PSPēPNē P°P±Ps PīPsPjC-C¶PSPēPNē PIPiP»PēPI PSP° CēPIPēPrPeC—C†C,CH
C¶PµP°PeC†C— P»CHPrPēPSPē, C,PsPjC† P°PjP±C†P»P°C,PsC¶PSPēC... PīP°C†C—PSC,C-PI
C†P»C-Pr PīPsPiPµC¶PµPrPēC,Pē PīC¶Ps PSPµPsP±C...C-PrPSC—C†C,CH
PrPsC,C¶PēPjP°PSPSC¶ PsC†PsP±P»PēPIPsC— PsP±PµC¶PµP¶PSPsC†C,C- PīC¶Pē
PePµC¶C†PIP°PSPSC- P°PIC,PsC,C¶P°PSC†PisC¶C,PsPj C‡Pē C¶PsP±PsC,C- P·
PsP±P»P°PrPSP°PSPSC¶Pj.

PŸPīPsC†C-P± P·P°C†C,PsC†C‡PIP°PSPSC¶ C,P° PrPsP·Pē.

P>C-PeC†PIP°PSPSC¶ C†P»C-Pr C¶PsP·PīPsC‡PēPSP°C,Pē C,P° PīC¶PsPIPsPrPēC,Pē PīC-Pr
PSP°PiP»C¶PrPsPj P»C-PeP°C¶C¶. PŸPµC¶P°PīC-CH C†P»C-Pr C¶PsP·PīPsC‡PēPSP°C,Pē
C,C-P»CHPePē P·P° C†PjPsPIPē PSP°C¶PIPSsC†C,C- PsPiC-PeC†PSP°, C¶PePēPNē P±C†PrPµ
C¶PµPiC†P»C¶C¶PSPs PePsPSC,C¶PsP»CHPIP°C,Pē PīC¶PēPNēPsPj PīC¶PµPīP°C¶P°C,C†
PīP°C†C—PSC,PsPj.

PŸP°P±P»PµC,PePē C†P»C-Pr PīC¶PēPNēPjP°C,Pē 1 C¶P°P· PSP° PrPsP±C† PePsP¶PSPsPiPs
PrPSC¶ PI PsPrPēPS C- C,PsPNē C†P°PjPēPNē C‡P°C†. PŸP°P±P»PµC,PePē PjPsP¶PSP°
PīC¶PēPNēPjP°C,Pē C¶P°P·PsPj P· C—P¶PµCH C‡Pē PSPµP·P°P»PµP¶PSPs PIC-Pr
PIP¶PēPIP°PSPSC¶ C—P¶C-.

PŸC¶PēPIP°P»C—C†C,CH P»C-PeC†PIP°PSPSC¶ C-PSPPrPēPIC-PrC†P°P»CHPSPs
PIPēP·PSP°C‡P°C” P»C-PeP°C¶, C¶PePēPNē PjP°C” PrPsC†PIC-Pr
PrC-P°PiPSPsC†C,C†PIP°PSPSC¶ C,P° P»C-PeC†PIP°PSPSC¶ C...PIPsC¶PsP±Pē
PhP»CHC†PiPµPNēPjPµC¶P°. P”C-P°PiPSPsP· C†P»C-Pr PIC†C,P°PSPsPIP»CHPIP°C,Pē
PIC-PrPīPsPIC-PrPSPs PrPs PrC-CHC‡PēC... PīC¶P°PeC,PēC‡PSPēC...
C¶PµPePsPjPµPSPPrP°C†C-PNē. PµPµC¶PµPSPsC†PēPjC—C†C,CH C- PrPsP·C†PIP°PSPSC¶
P»C-PeP°C¶C†CHPePsPiPs P·P°C†PsP±C† C†P»C-Pr C¶PµPiC†P»C¶C¶PSPs
PsC†C-PSC¶PIP°C,Pē, P±P°P¶P°PSPs PīC¶PsC,C¶PiPsPj 3 PjC—C†C¶C†C-PI PīC—C†P»C¶
PīPsC‡P°C,PeC† P»C-PeC†PIP°PSPSC¶. PŸP°PePēPj C‡PēPSPsPj, PeP»C-PSC—C‡PSC—
PīPµC¶PµPIP°PiPē P·P°C†C,PsC†C†PIP°PSPSC¶ PjPµPjP°PSC,PēPSC†
PiC-PrC¶PsC...P»PsC¶PēPrC† C,P° PīPµC¶PµPSPsC†PēPjC—C†C,CH P»C-PeP°C¶C†CHPePsPiPs
P·P°C†PsP±C† PīP°C†C—PSC,PsPj C†P»C-Pr C¶PµPiC†P»C¶C¶PSPs PīPµC¶PµPiP»C¶PrP°C,Pē
PIC-PrPīPsPIC-PrPSPs PrPs PīPsC,PsC‡PSPēC... PeP»C-PSC—C‡PSPēC...
C¶PµPePsPjPµPSPPrP°C†C-PNē. PµC-PrC,C¶PēPjC†CHC‡Pµ P»C-PeC†PIP°PSPSC¶ PjPsP¶Pµ
C,C¶PēPIP°C,Pē, PīPsPePē C,PµC¶P°PīPµPIC,PēC‡PSPēPNē PµC,,PµPeC,
PIPIP°P¶P°C,PēPjPµC,CHC†C¶ C†PīC¶PēC¶C,P»PēPIPēPj, C- PīP°C†C—PSC,
PīPµC¶PµPSPsC†PēC,PēPjPµ P»C-PeC†PIP°PSPSC¶ PjPµPjP°PSC,PēPSPsPj
PiC-PrC¶PsC...P»PsC¶PēPrPsPj. PµC¶PēPīPēPSPµPSPSC¶ C,PµC¶P°PīC—

$P \gg C - PeP^{\circ} C \bar{H} C \bar{I} C \bar{H} PeP \bar{e} P_j P \cdot P^{\circ} C \bar{I} PsP \pm PsP_j C \bar{I} P \gg C - Pr C \bar{H} PsP \cdot PiP \gg C \bar{I} PrP^{\circ} C, P \bar{e} C \bar{r} P \bar{I} P \bar{e} P \bar{I} P^{\circ} PrPeC \bar{r}, C \bar{I} PeC \% Ps P \cdot PSP \bar{e} PeP^{\circ} C'' C, P_{\mu} C \bar{H} P^{\circ} P \bar{i} P_{\mu} PIC, P \bar{e} C \bar{I} PSP \bar{e} P N_{\bar{e}} P_{\mu} C, P_{\mu} PeC, P^{\circ} P \pm Ps P \bar{i} P^{\circ} C \bar{I} C - C''PSC, P \bar{i} PsP \bar{i} P^{\circ} PSPs P \bar{i} P_{\mu} C \bar{H} P_{\mu} PSPs C \bar{I} P \bar{e} C, C \bar{H} P \gg C - PeC \bar{r} P \bar{i} P^{\circ} PSPSC \bar{I} P \bar{i} C \bar{H} P_{\mu} P \bar{i} P^{\circ} C \bar{H} P^{\circ} C, PsP_j.$

$P''PsC \bar{H} PsC \bar{I} P \gg C -.$

$P P_{\mu} PePsP_j P_{\mu} PSP PrPsP \bar{i} P^{\circ} PSP^{\circ} P \bar{i} PsC \bar{I} P^{\circ} C, PePsP \bar{i} P^{\circ} PrPsP \cdot P^{\circ} C \bar{I} C, P^{\circ} PSPsP \bar{i} P \bar{e} C, C \bar{H} 5 P_j P_i PSP^{\circ} PrPsP \pm C \bar{r}, C \bar{I} PeP^{\circ} P \bar{i} PsC \bar{I} C, C \bar{r} P \bar{i} PsP \bar{i} Ps P \cdot P \pm C - P \gg C \bar{H} C \bar{e} C \bar{r} C''C, C \bar{H} C \bar{I} C \bar{I} P \bar{i} C \bar{H} PsC, C \bar{I} P \bar{i} PsP_j P \bar{i} P_{\mu} C \bar{H} C \bar{e} P \bar{e} C...$

$4 C, P \bar{e} P \bar{i} PSC - P \bar{i} P \gg C - PeC \bar{r} P \bar{i} P^{\circ} PSPSC \bar{I}, PrPsC \bar{I} C \bar{I} P \bar{i} P^{\circ} C \bar{H} C \bar{I} P \bar{e} C \bar{H} P_{\mu} PePsP_j P_{\mu} PSP PrPsP \bar{i} P^{\circ} PSPsC - P \bar{i} C - PrC, C \bar{H} P \bar{e} P_j C \bar{r} C \bar{H} C \bar{I} PsC - PrPsP \cdot P \bar{e} C, P^{\circ} PeP \bar{e} P_j C \bar{I} P \bar{e} PSPsP_j:$

$1 - P N_{\bar{e}} C, P \bar{e} P \bar{i} PrP_{\mu} PSCH (1 - 7 - P N_{\bar{e}} PrP_{\mu} PSCH):$

$P \bar{i} P^{\circ} C \bar{I} C - C''PSC, C \bar{r} PSP_{\mu} PsP \pm C...C - PrPSPs P \bar{i} C \bar{H} P \bar{e} P N_{\bar{e}} P_j P^{\circ} C, P \bar{e} 5 P_j P_i PSP^{\circ} PrPsP \pm C \bar{r} P \bar{i} C \bar{H} PsC, C \bar{I} P \bar{i} PsP_j C, P \bar{e} P \bar{i} PSC \bar{I};$

$2 - P N_{\bar{e}} C, P \bar{e} P \bar{i} PrP_{\mu} PSCH (8 - 14 - P N_{\bar{e}} PrP_{\mu} PSCH):$

$P \bar{i} P^{\circ} C \bar{I} C - C''PSC, C \bar{r} PSP_{\mu} PsP \pm C...C - PrPSPs P \bar{i} C \bar{H} P \bar{e} P N_{\bar{e}} P_j P^{\circ} C, P \bar{e} 10 P_j P_i PSP^{\circ} PrPsP \pm C \bar{r} P \bar{i} C \bar{H} PsC, C \bar{I} P \bar{i} PsP_j C, P \bar{e} P \bar{i} PSC \bar{I};$

$3 - P N_{\bar{e}} C, P \bar{e} P \bar{i} PrP_{\mu} PSCH (15 - 21 - P N_{\bar{e}} PrP_{\mu} PSCH):$

$P \bar{i} P^{\circ} C \bar{I} C - C''PSC, C \bar{r} PSP_{\mu} PsP \pm C...C - PrPSPs P \bar{i} C \bar{H} P \bar{e} P N_{\bar{e}} P_j P^{\circ} C, P \bar{e} 15 P_j P_i PSP^{\circ} PrPsP \pm C \bar{r} P \bar{i} C \bar{H} PsC, C \bar{I} P \bar{i} PsP_j C, P \bar{e} P \bar{i} PSC \bar{I};$

$P \bar{i} PsC \bar{I} P \bar{e} PSP^{\circ} C \bar{H} C \bar{I} P \bar{e} P \cdot 4 - P \bar{i} Ps C, P \bar{e} P \bar{i} PSC \bar{I};$

$P \bar{i} P^{\circ} C \bar{I} C - C''PSC, C \bar{r} PSP_{\mu} PsP \pm C...C - PrPSPs P \bar{i} C \bar{H} P \bar{e} P N_{\bar{e}} P_j P^{\circ} C, P \bar{e} 20 P_j P_i PSP^{\circ} PrPsP \pm C \bar{r} PePsP \bar{i} PSPsP \bar{i} Ps PrPSC \bar{I}.$

$P P_{\mu} PePsP_j P_{\mu} PSP PrPsP \bar{i} P^{\circ} PSP^{\circ} P \bar{i} C - PrC, C \bar{H} P \bar{e} P_j C \bar{r} P \bar{i} P^{\circ} P \gg C \bar{H} PSP^{\circ} PrPsP \cdot P^{\circ} C \bar{I} C, P^{\circ} PSPsP \bar{i} P \bar{e} C, C \bar{H} 20 P_j P_i PSP^{\circ} PrPsP \pm C \bar{r}.$

$P_{\mu} P^{\circ} C \bar{I} C - C''PSC, P \bar{e} P \gg C - C, PSCH PsP \bar{i} Ps PIC - PeC \bar{e}.$

$P P_{\mu} PePsP_j P_{\mu} PSP PrPsP \bar{i} P^{\circ} PSP^{\circ} PrPsP \cdot P^{\circ} PrP \gg C \bar{I} P \bar{i} P^{\circ} C \bar{I} C - C''PSC, C - P \bar{i} PIC - PePsP_j PIC - Pr 65 C \bar{H} PsPeC - P \bar{i} C \bar{I} C, P^{\circ} PSPsP \bar{i} P \bar{e} C, C \bar{H} 20 P_j P_i PSP^{\circ} PrPsP \pm C \bar{r}, C \bar{I} Pe P \cdot P^{\circ} P \cdot PSP^{\circ} C \bar{I} P \bar{e} PSPs P \bar{i} P \bar{e} C \% P_{\mu}.$

$P_{\mu} PsC \bar{H} C \bar{e} C \bar{e} P_{\mu} PSPSC \bar{I} C, C \bar{e} PSPeC \bar{I} C - C - PSP \bar{e} C \bar{H} PsPe.$

$P''P \gg C \bar{I} P \bar{i} P^{\circ} C \bar{I} C - C''PSC, C - P \bar{i} C - P \cdot P \bar{i} PsC \bar{H} C \bar{r} C \bar{e} P_{\mu} PSPSC \bar{I} P_j C, C \bar{r} PSPeC \bar{I} C - C - PSP \bar{e} C \bar{H} PsPe P \gg P_{\mu} P \bar{i} PePsP \bar{i} Ps C \bar{I} C, C \bar{r} P \bar{i} P_{\mu} PSCH (PeP \gg C - C \bar{H} P_{\mu} PSCH PeC \bar{H} P_{\mu} P^{\circ} C, P \bar{e} PSC - PSC \bar{r} \bar{b} \bar{H}'' 50 - 80 P_j P \gg C...P \bar{i} P \cdot PSP \bar{e} P \bar{i} P_{\mu} PSPSC \bar{I} PrPsP \cdot P \bar{e} P \bar{i} C \bar{H} P_{\mu} P \bar{i} P^{\circ} C \bar{H} P^{\circ} C, C \bar{r} PSP_{\mu} P \bar{i} PsC, C \bar{H} C - P \pm PSP_{\mu}. P_{\mu} P^{\circ} C \bar{I} C - C''PSC, P^{\circ} P_j C - P \cdot P \bar{i} PsC \bar{H} C \bar{r} C \bar{e} P_{\mu} PSPSC \bar{I} P_j P \bar{e} C, C \bar{r} PSPeC \bar{I} C - C - PSP \bar{e} C \bar{H} PsPe C \bar{I} P_{\mu} C \bar{H} P_{\mu} PrPSCH PsP \bar{i} Ps C \bar{I} C, C \bar{r} P \bar{i} P_{\mu} PSCH (PeP \gg C - C \bar{H} P_{\mu} PSCH PeC \bar{H} P_{\mu} P^{\circ} C, P \bar{e} PSC - PSC \bar{r} \bar{b} \bar{H}'' 30 - 49 P_j P \gg C...P \bar{i} P) PrPsP \pm PsPIC \bar{r} PrPsP \cdot C \bar{r} C \bar{I} P \gg C - Pr P \cdot P_j P_{\mu} PSCH P \bar{e} C, P \bar{e} PrPs 10 P_j P_i. P''PsP \cdot C \bar{r} P_j PsP \bar{i} PSP^{\circ} P \cdot P \pm C - P \gg C \bar{H} C \bar{e} P \bar{e} C, P \bar{e} PrPs 20 P_j P_i PSP^{\circ} PrPsP \pm C \bar{r} P \cdot P^{\circ} C \bar{I} C, P^{\circ} PSP PrP^{\circ} C \bar{H} C, PSPsC \bar{H} C \bar{I} C...P_{\mu} P_j PsC \bar{H}, C \bar{I} PeC \% Ps PSP_{\mu} P \bar{i} P^{\circ} C, P \bar{e} P \bar{i} PSP \bar{e} C... C \bar{H} P_{\mu} P^{\circ} PeC \bar{I} C - P N_{\bar{e}} PSP_{\mu} P_j P^{\circ} C'' P \bar{i} C \bar{H} P \bar{e} PSP^{\circ} P N_{\bar{e}} P_j PSC - P \bar{i} C - C \bar{I} P \gg C \bar{I} 7 PrPSC - P \bar{i}$

P— P±PsPeCř CĹPμCĤC†PμPIPs- CĹCřPrPëPSPSPSc— CĹPëCĹC,PμPjPë	P§P°CĹC,Ps PķPμC†P°CĹC,Ps	PĥCĤC,PμCĤC-P°P»CḤPSP° PiC-PiPμCĤC,PμPSP·C-CĹ PŸPμCĤC†PμPIP° PSPμPrPsCĹC,P°C,PSC-CĹC,CḤ P’PμPSPsP·PSPëPN̄ C,CĤPsPjP±PsP·/C,CĤPsPjP±PsPμPjP±PsP»C-P·Pj P—P°PrPëCëPeP°
P— P±PsPeCř PrPëC...P°P»CḤPSPSc— CĹPëCĹC,PμPjPë P— P±PsPeCř C,CĤP°PIPSPsC— CĹPëCĹC,PμPjPë	P§P°CĹC,Ps PķPμC†P°CĹC,Ps P§P°CĹC,PsC,P° PSPμPIC-PrPsPjP°	P—P°PiPsCĤ P’P»CḤPIP°PSPSCĹ PμP°PSPeCĤPμP°C,PëC, ²
P— P±PsPeCř PiPμC†C-PSPePë C,P° P¶PsPIC†PsPIPëPIC-PrPSPëC... CëP»CĹC...C-PI	P§P°CĹC,Ps P§P°CĹC,PsC,P° PSPμPIC-PrPsPjP°	PμC-PrPIPëC%PμPSPSCĹ PiPsPeP°P·PSPëPeC-PI C,,CřPSPeC†C-C— PiPμC†C-PSPePë P’PμPiP°C,PëC, P’PsP»PsPIPSPëPN̄ P±C-P»CḤ PμC-PrPIPëC%PμPSP° PIC,PsPjP»CḤPIP°PSC-CĹC,CḤ
P—P°PiP°P»CḤPSC- PiPsCĤCřCëPμPSPSCĹ	P§P°CĹC,Ps PķPμC†P°CĹC,Ps	

¹ P’P°P»CḤC†PëPSP°C†C-C— PiPμCĤPμPIP°P¶PSPs CĹPiPsCĹC,PμCĤC-PiP°P»Pë Cř
PiP°C†C-C’’PSC,C-PI C-P· C,CĹP¶PePsCĤ C,,PsCĤPjPsCĤ C...PIPsCĤPsP±Pë
PĥP»CḤC†PiPμPN̄PjPμCĤP°.

² PhPeCĤPμPjC- PiPsPIC-PrPsPjP»PμPSPSCĹ PiCĤPë PjPμPrPëC†PSPsPjCř
P·P°CĹC,PsCĹCřPIP°PSPSC-.

PĹPIPsCĤPsP±P° PĥP»CḤC†PiPμPN̄PjPμCĤP° PiPsPIBĤ™ CĹP·P°PSP° P· PrPμPiCĤPμCĹC-C’’CĤ,
CĹCřC—C†PëPrP°P»CḤPSPëPjPë C-PrPμCĹPjPë C,P° CĹCřC—C†PëPrPsPj. PŸP°PeC-
PIPëPiP°PrPePë PIC-PrPsPjC- PiCĤPë PjPμPrPëC†PSPsPjCř P·P°CĹC,PsCĹCřPIP°PSPSC-
PjPμPjP°PSC,PëPSCř.

PŸPμCĤPjC-PS PiCĤPëPrP°C,PSPsCĹC,C-. 3 CĤPsPePë.

PJjPsPIPë P·P±PμCĤC-PiP°PSPSCĹ. P—P±PμCĤC-PiP°C,Pë Cř PSPμPrPsCĹC,CřPiPSPsPjCř
PrP»CĹ PrC-C,PμPN̄ PjC-CĹC†C- PI PsCĤPëPiC-PSP°P»CḤPSC-PN̄ CřPiP°PePsPIC†C- PiCĤPë
C,PμPjPiPμCĤP°C,CřCĤC- PSPμ PIPëC%Pμ 25 B°PŸ.

PJPiP°PePsPIPeP°. PĥPμPjPsPeCĹ 10: PiPs 10 C,P°P±P»PμC,PsPe Cř P±P»C-CĹC,PμCĤC-;
PiPs 3 P°P±Ps 6 P±P»C-CĹC,PμCĤC-PI Cř PeP°CĤC,PsPSPSC-PN̄ PiP°C†C†C-.

PĥPμPjPsPeCĹ 20: PiPs 10 C,P°P±P»PμC,PsPe Cř P±P»C-CĹC,PμCĤC-; PiPs 3 P°P±Ps 6
P±P»C-CĹC,PμCĤC-PI Cř PeP°CĤC,PsPSPSC-PN̄ PiP°C†C†C-.

$$\mathbf{P} \mathbf{L} \mathbf{P}^{\circ} \mathbf{C}, \mathbf{P}_{\mu} \mathbf{P} \mathbf{i} \mathbf{P} \mathbf{s} \mathbf{C} \mathbf{H} \mathbf{C} - \mathbf{C} \mathbf{H} \mathbf{P} \mathbf{I} \mathbf{C} - \mathbf{P} \mathbf{r} \mathbf{P} \mathbf{i} \mathbf{C} \mathbf{r} \mathbf{C} \mathbf{I} \mathbf{P} \mathbf{e} \mathbf{C} \mathbf{r}. \mathbf{P} - \mathbf{P}^{\circ} \mathbf{C} \mathbf{H} \mathbf{P}_{\mu} \mathbf{C} \mathbf{r} \mathbf{P}_{\mu} \mathbf{P} \mathbf{i} \mathbf{C}, \mathbf{P} \mathbf{s} \mathbf{P} \mathbf{j}.$$

P'PëC₇PsP±PSPëPë. PÿPhP' B«PαP°C₇PjP° PÿC,P°C₇C,B» (C„P°CíCíPIP°PSPSCII C,P° PiP°PëCíPIP°PSPSCII P· C„,PsC₇PjPë in bulk C„C-C₇PjPë PÿC-PSC,PsPS PíC-CíPiP°PSC-CII, Pÿ.P>., PíCíPiP°PSC-CII).

**P_HC-ClC†P_μP·PSP°C...PsPrP¶P_μPSPSCII PIPëC₇PsP±PSPëPeP° C,P° P°PrC₇P_μClP°
PjC-ClC†CII PiC₇PsPIP°PrP¶P_μPSPSCII PN₂PsPiPs PrC-CII»CH₃PSPsClC,C,-.**

$$\text{P}|\text{P}\epsilon\text{C}\overline{\text{H}}\text{P}^{\circ}\text{C}-\text{PSP}^{\circ}, 03124, \text{P}]. \text{P}\overline{\text{L}}\text{P}\overline{\text{e}}\text{C}-\text{PI}, \text{P}\pm\text{C}\overline{\text{r}}\text{P}\gg\text{CH}\text{PIP}^{\circ}\text{C}\overline{\text{H}} \text{P}'\text{P}^{\circ}\text{C}\overline{\text{r}}\text{P}\gg\text{P}^{\circ}\text{PIP}^{\circ} \text{P}''\text{P}^{\circ}\text{PIP}_{\mu}\text{P}\gg\text{P}^{\circ}, 8.$$

$PJ\ C\overline{H}P^{\circ}P\cdot C - PIP\ddot{e}PSP\ddot{e}PePSP\mu PSPSC\overline{C}I\ P\ddot{i}PsP\pm C - C\ddagger PSP\ddot{e}C... P\mu C,,P\mu PeC,C-PI\ C,P^{\circ}$
 $P\cdot P^{\circ}P\ddot{i}P\ddot{e}C,P^{\circ}PSC\overline{H}\ C\%PsPrPs\ P\pm P\mu P\cdot P\ddot{i}P\mu PeP\ddot{e}\ P\cdot P^{\circ}C\overline{I}^{\circ}C,PsC\overline{I}^{\circ}C\acute{e}PIP^{\circ}PSPSC\overline{C}I$
 $P\gg C-PeP^{\circ}C\overline{H}C\overline{I}^{\circ}CHPePsPiPs\ P\cdot P^{\circ}C\overline{I}^{\circ}PsP\pm C\acute{e}\ P\ddot{i}C\overline{H}PsC\overline{I}^{\circ}P\ddot{e}PjPs\ P\cdot PIP\mu C\overline{H}C,P^{\circ}C,P\ddot{e}C\overline{I}^{\circ}C\overline{C}I\ PrPs$
 $PIC-PrPrC-P\gg C\acute{e}\ C,,P^{\circ}C\overline{H}PjP^{\circ}PePsPSP^{\circ}PiP\gg C\overline{C}IPrC\acute{e}\ P\ddot{y}PhP'\ B\langle PhP\ddot{Y}P\ddagger P\acute{k}Ph\ PjP_{\circ}P\ PhP\ddagger P\acute{k}PhB\rangle\ P\cdot P^{\circ}$
 $P^{\circ}PrC\overline{H}P\mu C\overline{I}^{\circ}PsC\overline{H}: P\pm C\acute{e}P\gg CHPIP^{\circ}C\overline{H}\ P'P^{\circ}C\ddagger P\gg P^{\circ}PIP^{\circ}\ P''P^{\circ}PIP\mu P\gg P^{\circ}, 8, Pj. P_{\circ}P\ddot{e}C-PI, 03124,$
 $C,P\mu P\gg/C,,P^{\circ}PeC\overline{I}^{\circ}: 38\ 044\ 281\ 2333.$