

## A. Alignment of Tp0954 sequence from five different *T. pallidum* strain of different geographic origins

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Nichols 1 MRYGTLFKVSVLLGALFVSCVSTGNSARESERAQLLKSENPNIRFAAQLSGLLEKQRWEEALQLFDLTPSPEHRAEKRIQYLYLSTLISAGKLTHAQELA
SS14 1 MRYGTLFKVSVLLGALFVSCVSTGNSARESERAQLLKSENPNIRFAAQLSGLLEKQRWEEALQLFDLTPSPEHRAEKRIQYLYLSTLISAGKLTHAQELA
Chicago 1 MRYGTLFKVSVLLGALFVSCVSTGNSARESERAQLLKSENPNIRFAAQLSGLLEKQRWEEALQLFDLTPSPEHRAEKRIQYLYLSTLISAGKLTHAQELA
Mexico A 1 MRYGTLFKVSVLLGALFVSCVSTGNSARESERAQLLKSENPNIRFAAQLSGLLEKQRWEEALQLFDLTPSPEHRAEKRIQYLYLSTLISAGKLTHAQELA
Amoy 1 MRYGTLFKVSVLLGALFVSCVSTGNSARESERAQLLKSENPNIRFAAQLSGLLEKQRWEEALQLFDLTPSPEHRAEKRIQYLYLSTLISAGKLTHAQELA

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Nichols EKLQDGP TASE TVQLWYAHAMIAQAKRDVRKKKQYVEKILAQDPHDLWALTERGYDFLSVNDYAQAVQAFSRALRVEPRAQDARVGLGKVVYLLQGMQE
SS14 EKLQDGP TASE TVQLWYAHAMIAQAKRDVRKKKQYVEKILAQDPHDLWALTERGYDFLSVNDYAQAVQAFSRALRVEPRAQDARVGLGKVVYLLQGMQE
Chicago EKLQDGP TASE TVQLWYAHAMIAQAKRDVRKKKQYVEKILAQDPHDLWALTERGYDFLSVNDYAQAVQAFSRALRVEPRAQDARVGLGKVVYLLQGMQE
Mexico A EKLQDGP TASE TVQLWYAHAMIAQAKRDVRKKKQYVEKILAQDPHDLWALTERGYDFLSVNDYAQAVQAFSRALRVEPRAQDARVGLGKVVYLLQGMQE
Amoy EKLQDGP TASE TVQLWYAHAMIAQAKRDVRKKKQYVEKILAQDPHDLWALTERGYDFLSVNDYAQAVQAFSRALRVEPRAQDARVGLGKVVYLLQGMQE

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Nichols AEAQYRQVLQDTPHEHERALAECA RVKAETNRVLEAIRDLE RVVQLDPHDPAYWTDLGT YLSQAGKKERAAAAFERAVALSADAYFAHIYLGGIYDELGRA
SS14 AEAQYRQVLQDTPHEHERALAECA RVKAETNRVLEAIRDLE RVVQLDPHDPAYWTDLGT YLSQAGKKERAAAAFERAVALSADAYFAHIYLGGIYDELGRA
Chicago AEAQYRQVLQDTPHEHERALAECA RVKAETNRVLEAIRDLE RVVQLDPHDPAYWTDLGT YLSQAGKKERAAAAFERAVALSADAYFAHIYLGGIYDELGRA
Mexico A AEAQYRQVLQDTPHEHERALAECA RVKAETNRVLEAIRDLE RVVQLDPHDPAYWTDLGT YLSQAGKKERAAAAFERAVALSADAYFAHIYLGGIYDELGRA
Amoy AEAQYRQVLQDTPHEHERALAECA RVKAETNRVLEAIRDLE RVVQLDPHDPAYWTDLGT YLSQAGKKERAAAAFERAVALSADAYFAHIYLGGIYDELGRA

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Nichols EKAIEHYQRAVQLYPKYHFSFESLGVLFWEQQRWEEAREAFATALTYAPTNI SYALMTALCLCQMGQAHK AQHFMR T FIRTVDRTREVEYFLCRLFVDL
SS14 EKAIEHYQRAVQLYPKYHFSFESLGVLFWEQQRWEEAREAFATALTYAPTNI SYALMTALCLCQMGQAHK AQHFMR T FIRTVDRTREVEYFLCRLFVDL
Chicago EKAIEHYQRAVQLYPKYHFSFESLGVLFWEQQRWEEAREAFATALTYAPTNI SYALMTALCLCQMGQAHK AQHFMR T FIRTVDRTREVEYFLCRLFVDL
Mexico A EKAIEHYQRAVQLYPKYHFSFESLGVLFWEQQRWEEAREAFATALTYAPTNI SYALMTALCLCQMGQAHK AQHFMR T FIRTVDRTREVEYFLCRLFVDL
Amoy EKAIEHYQRAVQLYPKYHFSFESLGVLFWEQQRWEEAREAFATALTYAPTNI SYALMTALCLCQMGQAHK AQHFMR T FIRTVDRTREVEYFLCRLFVDL

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Nichols SGEQDMASRISKIKSVQRI RY SFYLAF F YELGGRHLLAEKHYGEVESARAPSSFEHRLAVSALGRLRGRSSSLRTNP 478
SS14 SGEQDMASRISKIKSVQRI RY SFYLAF F YELGGRHLLAEKHYGEVESARAPSSFEHRLAVSALGRLRGRSSSLRTNP 478
Chicago SGEQDMASRISKIKSVQRI RY SFYLAF F YELGGRHLLAEKHYGEVESARAPSSFEHRLAVSALGRLRGRSSSLRTNP 478
Mexico A SGEQDMASRISKIKSVQRI RY SFYLAF F YELGGRHLLAEKHYGEVESARAPSSFEHRLAVSALGRLRGRSSSLRTNP 478
Amoy SGEQDMASRISKIKSVQRI RY SFYLAF F YELGGRHLLAEKHYGEVESARAPSSFEHRLAVSALGRLRGRSSSLRTNP 478
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## B. Alignment of Tp0954 of Nichols Houston and *T. paraluisuniculi* homolog

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Houston MRYGTLFKVSVLLGALFVSCVSTGNSARESERAQLLKSENPNIRFAAQLSGLLEKQRWEEALQLFDLTPSPEHRAEKRIQYLYLSTLISAGKLTHAQELA
Paraluisc. MRYGTLFKVSVLLGALFVSCVSTGNSARESERAQLLKSENPNIRFAAQLSGLLEKQRWEEALQLFDLTPSPEHRAEKRIQYLYLSTLISAGKLTHAQELA

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Houston EKLQDGP TASE TVQLWYAHAMIAQAKRDVRKKKQYVEKILAQDPHDLWALTERGYDFLSVNDYAQAVQAFSRALRVEPRAQDARVGLGKVVYLLQGMQE
Paraluisc. EKLQDGP TASE TVQLWYAHAMIAQAKRDVRKKKQYVEKILAQDPHDLWALTERGYDFLSVNDYAQAVQAFSRALRVEPRAQDARVGLGKVVYLLQGMQE

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Houston AEAQYRQVLQDTPHEHERALAECA RVKAETNRVLEAIRDLE RVVQLDPHDPAYWTDLGT YLSQAGKKERAAAAFERAVALSADAYFAHIYLGGIYDELGRA
Paraluisc. AEAQYRQVLQDTPHEHERALAECA RVKAETNRVLEAIRDLE RVVQLDPHDPAYWTDLGT YLSQAGKKERAAAAFERAVALSADAYFAHIYLGGIYDELGRA

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Houston EKAIEHYQRAVQLYPKYHFSFESLGVLFWEQQRWEEAREAFATALTYAPTNI SYALMTALCLCQMGQAHK AQHFMR T FIRTVDRTREVEYFLCRLFVDL
Paraluisc. EKAIEHYQRAVQLYPKYHFSFESLGVLFWEQQRWEEAREAFATALTYAPTNI SYALMTALCLCQMGQAHK AQHFMR T FIRTVDRTREVEYFLCRLFVDL

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Houston SGEQDMASRISKIKSVQRI RY SFYLAF F YELGGRHLLAEKHYGEVESARAPSSFEHRLAVSALGRLRGRSSSLRTNP 478
Paraluisc. SGEQDMASRISKIKSVQRI RY SFYLAF F YELGGRHLLAEKHYGEVESARAPSSFEHRLAVSALGRLRRSSSLRTNP 478
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