PLA 3.0

# Why parallelism matters for potencies

Next PLA 3.0 Webinar & Trainings

| Basics Webinar | End User Training | Super User Training |
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| // Sep 17, Europe - Middle East - Africa - Asia - Oceania<br>// Sep 17, The Americas - Europe<br>// Sep 22, The Americas - Europe | // Nov 05, Europe - Middle East - Africa<br>// Nov 05, The Americas<br>// Nov 06, Asia - Oceania | // Sep 28-29, Asia - Oceania<br>// Oct 05-06, The Americas |

*For further dates and times, please check our Webinar & Trainings Calendar below*

Dear Max,

In This Newsletter:

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- Meet us at
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Why parallelism matters for potencies

As you might know, PLA 3.0 is an extensible platform that is capable of performing many types of analysis, depending on the add-ons you're using. But Initially, the P in PLA stood for 'parallel'. In today's newsletter, we'll have a look at why parallelism is such an important concept, and what advantages PLA 3.0 offers for your (parallel line) analysis.

Why parallelism matters for drug comparison
When comparing the effectiveness of two methods for achieving the same goal, it is often difficult to find a single number that can be used to describe which method (or drug) is "better". Consider the following example:

You're a gardener, but your garden is infected with aphids. So you go shopping for insecticides. At the local store, two brands are available. Brand A claims that a dose of 10 grams (0.35 oz.) per liter (1/4 gallon) will produce a solution that kills 50% of all aphids. Brand B claims that a dose of 5 grams (0.18 oz.) per liter (1/4 gallon) will produce a solution that kills 50% of all aphids.

So both brand's advertisements make a statement about the dosage that is required to achieve half of the desired effect (killing all the aphids plaguing your garden), that is, about their respective EC50s, which are in this case LD50s. Brand B seems to be twice as effective, or twice as potent, at solving your aphid problem. Easy choice, right?
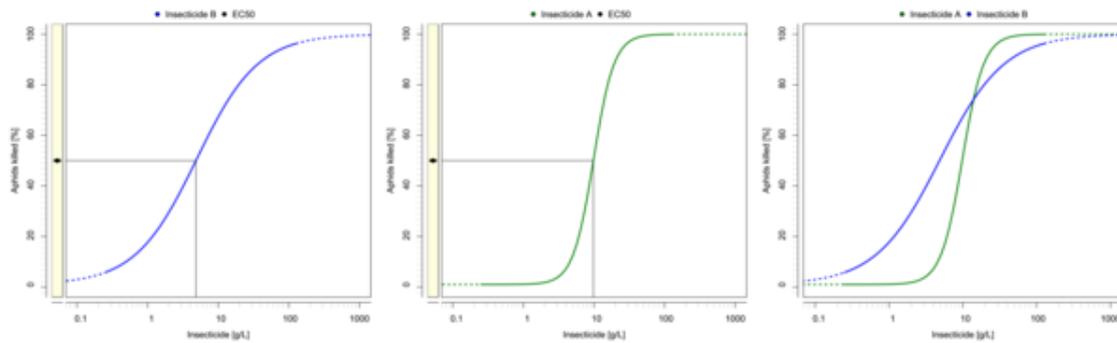
*If the curves are not similiar, comparison of EC50 can yield misleading results*

Not so fast. Take a closer look at the dose-response curves above. In this idealized example, both dose-response relationships are perfectly described by 4-parameter logistic curves, which implies that the EC50 is the inflection point of the curve. Both of the marketing statements of brand A and brand B are correct, i.e. the EC50 of brand A is at 10 grams per liter, while the EC50 of brand B is at 5 grams per liter. But the overlay plot clearly shows that, if your interest is to kill almost all the bugs (and not only half of them) in your garden, brand A is the better choice. Since the dose-response relationships are dissimilar, comparing the two products using only a single number, e.g. "2" as in "twice as potent", is misleading marketing at best, but, depending on the drug or substance that is being evaluated, can be very dangerous.

What are "parallel" curves?
As you've learned in basic geometry, two lines are parallel if their slopes are identical and their intercepts are different. When graphed, the plot of the parallel line looks shifted or translated. In fact, the graphs never intersect. For curves, e.g. a 4-parameter logistic curve, the "identical slope" characterization of parallelism does no longer apply, but the other interpretations of parallelism can be generalized. For example, two 4-parameter logistic curves are said to be parallel, or similar, if their asymptotes and effect rates (their B-parameters) are identical and only their Inflection points (C-parameters) differ. Graphically, the curves look like horizontally translated copies of each other.
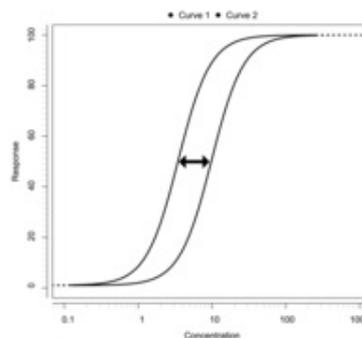


*A pair of parallel 4PL curves*

Comparing parallel curves
If the dose-response curves describing your insecticides (or the standard and the test sample of the drug you're assaying) are perfectly parallel, comparing the activity of your compounds using a single number is straightforward. Since all the parameters except the EC50s are identical, comparing the EC50s can be used to determine a relative potency. However, in the real world, conditions are never perfect and even small measurement errors will ensure that all parameters of your curves will have small differences, even when assaying the same sample twice.

How parallel is parallel enough?
To justify using the relative potency as a final number, you'll have to show that your two substances are parallel "enough". When using PLA (remember, the "P" stands for parallel), you can detect dissimilarity by using the extensive and fully configurable test system that supports hypothesis testing (F-test) , equivalence testing, or a combination of both.

This concludes today's newsletter. Join us next week, where we will take a look at the differences between fitting parallel curves and parallel lines.

## 50% discount on PLA 3.0 Trainings & Webinars

During the Corona crisis, we offer a 50% discount on all of our virtual business classes.* All virtual trainings are now offered for all three major world regions. The timings of the classes will allow participation within office hours in all regions

- Asia, Australia, Oceania
- The Americas
- Europe, Middle East, Africa

For trainings, webinar dates and times, please go to our Training Center.

*This offer is limited until December 31, 2020. Seats are limited. All prices published in Eventbrite include a 50% discount

Best regards
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## Meet us at

- 2020 BEBPA EUR Bioassay Conference,
September 21-24, 2020 | Virtual Conference
- Well Characterized Biologics & Biological Assays,
October 27-29, 2020 | Hyattsville, MD, USA

If you wish to meet one of our representatives, please contact our Sales Team by mail.

## Webinar & Trainings Calender



**// Sep 17, Europe - Middle East - Africa - Asia - Oceania, 1.25h**
 *Frankfurt 8 a.m. / Moscow 9 a.m. / New Delhi 11:30 a.m. / Peking 2 p.m. / Sydney 4 p.m.*

**// Sep 17, The Americas - Europe, 1.25h**
 *San Francisco 8 a.m. / Boston 11 a.m./ São Paulo 12 p.m. / Frankfurt 5 p.m.*

**// Sep 22, The Americas - Europe, 1.25h**
 *San Francisco 8 a.m. / Boston 11 a.m./ São Paulo 12 p.m. / Frankfurt 5 p.m.*

**// Sep 23, Europe - Middle East - Africa - Asia - Oceania, 1,25h**
 *Frankfurt 8 a.m. / Moscow 9 a.m. / New Delhi 11:30 a.m. / Peking 2 p.m. / Sydney 4 p.m.*



**// Nov 05, Europe - Middle East - Africa, 3.5h**
 *Frankfurt 9 a.m. / Moscow 10 a.m. / New Delhi 12:30 p.m.*

**// Nov 05, The Americas, 3.5h**
 *San Francisco 8 a.m. / Boston 11 a.m. / São Paulo 12 p.m.*

**// Nov 06, Asia - Oceania, 3.5h**
 *New Delhi 8:30 a.m. / Peking 11 a.m. / Sydney 1 p.m.*

**PLA 3.0**

Super User Training

// Sep 14-15, Europe - Middle East - Africa, 6h
*Frankfurt 9 a.m. / Moscow 10 a.m. / New Delhi 12:30 p.m.*

// Sep 28-29, Asia - Oceania, 6h
*New Delhi 7:30 a.m. / Peking 10 a.m. / Sydney 12 p.m.*

// Oct 05-06, The Americas, 6h
*San Francisco 8 a.m. / Boston 11 a.m. / São Paulo 12 p.m.*

**PLA 3.0**

Advanced Analysis Workshop

// Sep 16, Europe - Middle East - Africa, 6h
*Frankfurt 9 a.m. / Moscow 10 a.m. / New Delhi 12:30 p.m.*

// Sep 30, Asia - Oceania, 6h
*New Delhi 7:30 a.m. / Peking 10 a.m. / Sydney 12 p.m.*

// Oct 07, The Americas, 6h
*San Francisco 8 a.m. / Boston 11 a.m. / São Paulo 12 p.m.*

## Corporate Training

Are you interested in a corporate in-house training? Please contact us via mail or visit our website.

## Latest Releases

**PLA 3.0.4 SR6 (build 762)**
Released: 2018/09/28
PLA 3.0.4 includes Biological Assay Package 23

**Biological Assay Package 26 SR1 (build 1043)**
Released: 2019/05/17

**PLA 2.1 (build 605 SR1)**
Released: 2019/09/30

Download

## Add-ons for PLA 3.0

PLA is an extensible platform. The user has several options to customize this platform and extend its functionality with add-ons. Go to our website and find it under 'Products'.

Click here - if you don't want to receive our newsletters anymore.