

HelmholtzZentrum münchen

Deutsches Forschungszentrum für Gesundheit und Umwelt

OPEN SCIENCE IN DEN LEBENSWISSENSCHAFTEN ZWISCHEN ALLTAG UND UTOPIE



PD Dr. Wolfgang zu Castell

Helmholtz Zentrum München
Abteilung Scientific Computing

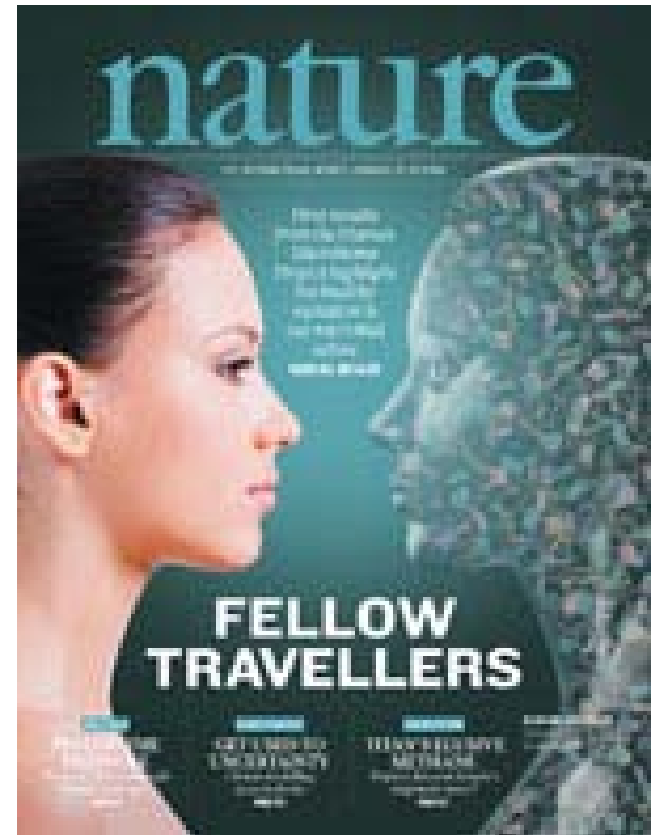
Potsdam, 27./28. November 2013

Mit wem spreche ich hier ...

- der Körper besitzt um einen Faktor 10 mehr Mikroorganismen als Körperzellen
- mehrere metabolische Störungen werden mit einer Veränderung der bakteriellen Gemeinschaft in Verbindung gebracht
- Mensch: 20.000-25.000 Gene
Mikrobiom: 3,3 Millionen Gene
- **die große Masse unserer Begleiter im Darm sind uns bisher unbekannt!**

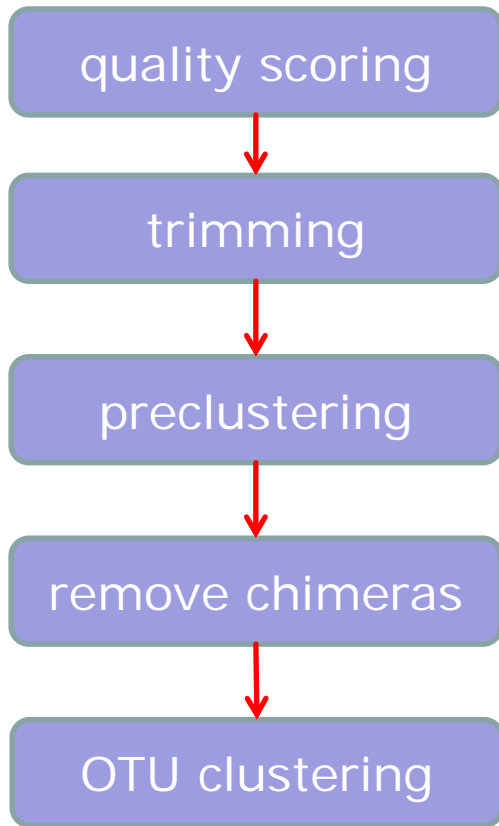
Aufgaben der Mikroorganismen

- funktionale Erweiterung („external organ“)
(z.B. Fermentation langkettiger Fettsäuren)
- Pathogenabwehr
- Formung des Immunsystems
- Stabilisierung spezifischer Habitate



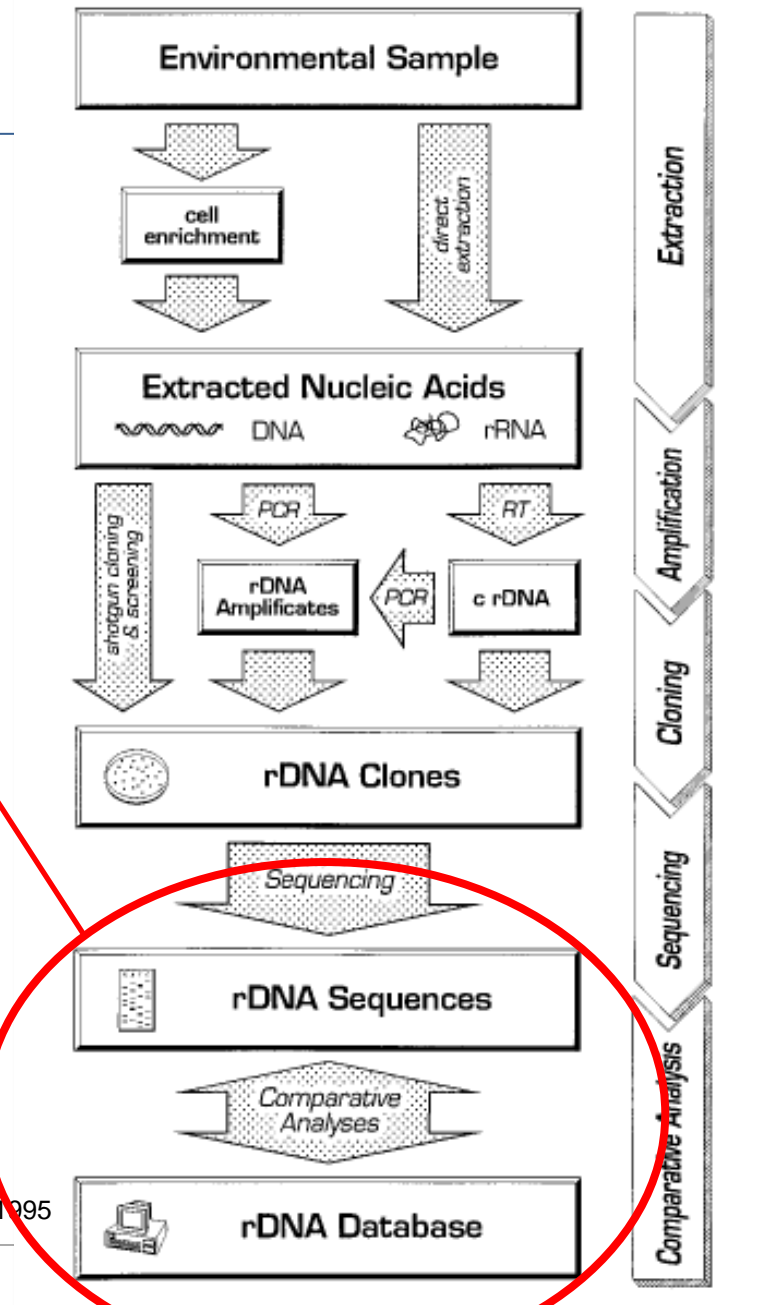
Human Microbiome Project

Sequenzierung

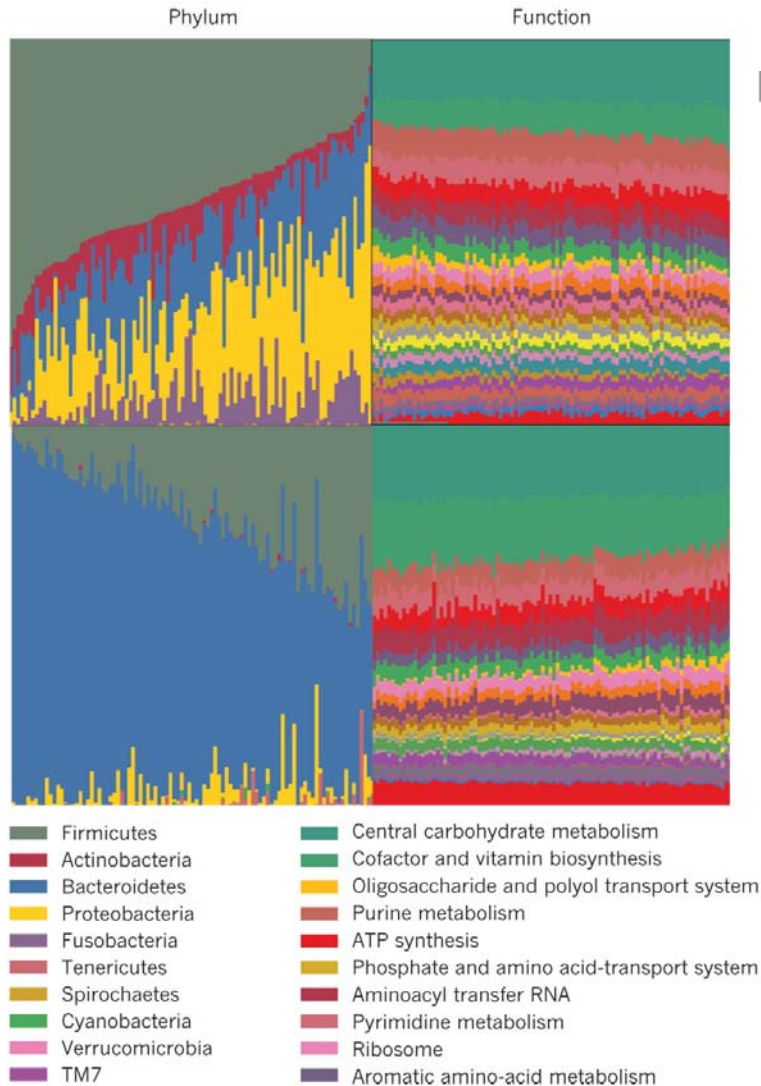


„pyrosequencing“ liefert in PubMed 4487 Treffer

Amann et al., Microbiol. Rev. 1995



Faszinierende Ergebnisse in der biologischen Forschung!



Lozupone et al., Nature 2012

Gut microbiota

ORIGINAL ARTICLE

Decreased gut microbiota diversity, delayed Bacteroidetes colonisation and reduced Th1 responses in infants delivered by Caesarean section

Hedvig E Jakobsson,^{1,2} Thomas R Abrahamsson,³ Maria C Jenmalm,^{3,4} Keith Harris,⁵ Christopher Quince,⁵ Cecilia Jemberg,¹ Bengt Björkstén,^{6,7} Lars Engstrand,² Anders F Andersson⁸

OPEN ACCESS Freely available online

PLoS one

Gut Microbiome Metagenomics Analysis Suggests a Functional Model for the Development of Autoimmunity for Type 1 Diabetes

Christopher T. Brown¹, Austin G. Davis-Richardson¹, Adriana Giongo¹, Kelsey A. Gano¹, David B. Crabb¹, Nabanita Mukherjee², George Casella², Jennifer C. Drew¹, Jorma Ilonen³, Mikael Knip⁴, Heikki Hyöty⁵, Riitta Veijola⁶, Tuula Simell⁷, Olli Simell⁷, Josef Neu⁸, Clive H. Wasserfall⁹, Desmond Schatz⁸, Mark A. Atkinson⁹, Eric W. Triplett^{1*}

Essay

Why Most Published Research Findings Are False

John P. A. Ioannidis

Summary

There is increasing concern that most current published research findings are false. The probability that a research claim is true may depend on study power and bias, the number of other studies on the same question, and, importantly, the ratio of true to no relationships among the relationships probed in each scientific field. In this framework, a research finding

Ioannidis, PLoS Medicine 2005

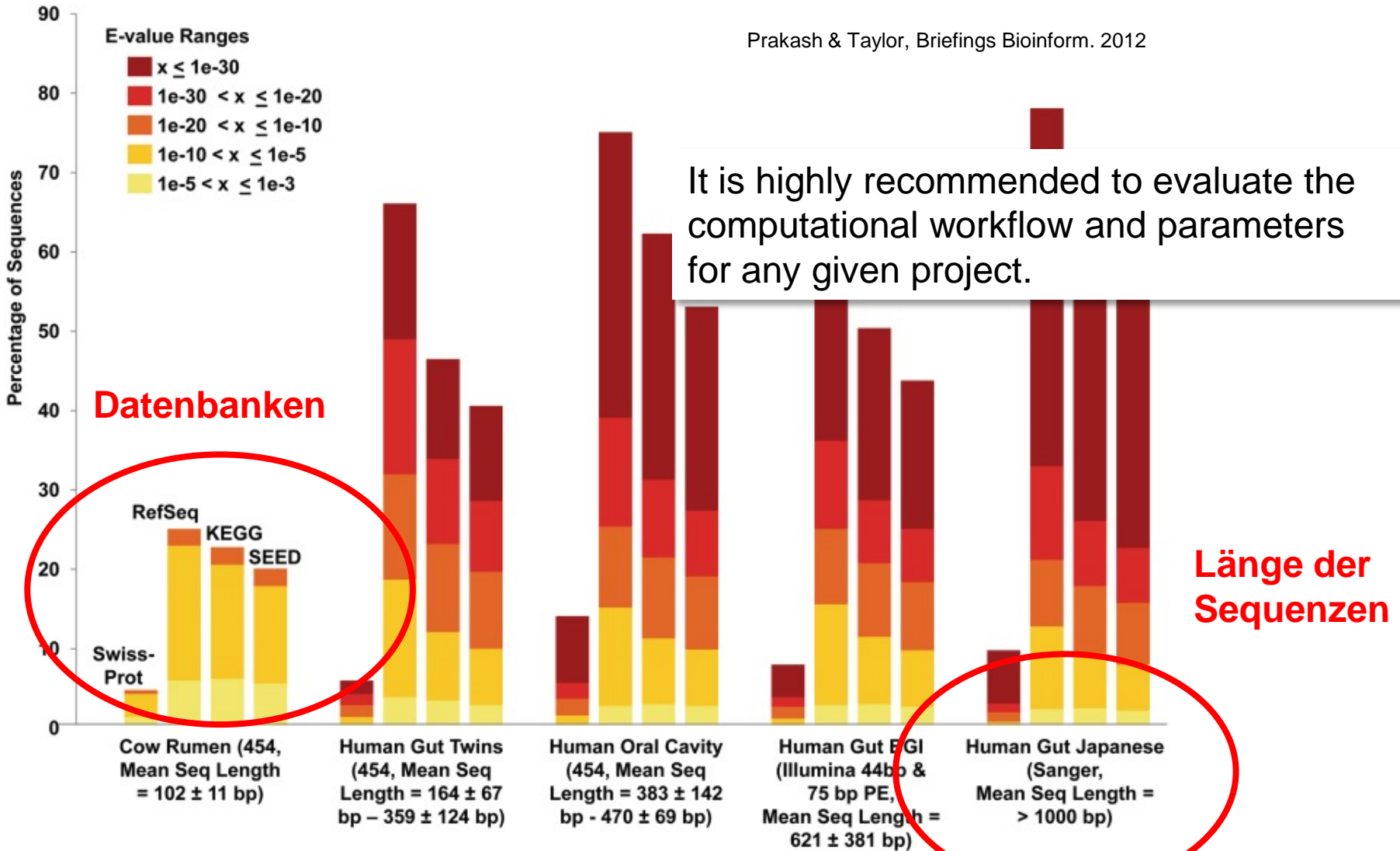
factors that influence this problem and some corollaries thereof.

is characteristic of the field and can vary a lot depending on whether the field targets highly likely relationships

There is increasing concern that most current published research findings are false. The probability that a research claim is true may depend on study power and bias, the number of other studies on the same question, and, importantly, the ratio of true to no relationships.

Wo sind Probleme ... (zwei technische Beispiele)

Prakash & Taylor, Briefings Bioinform. 2012

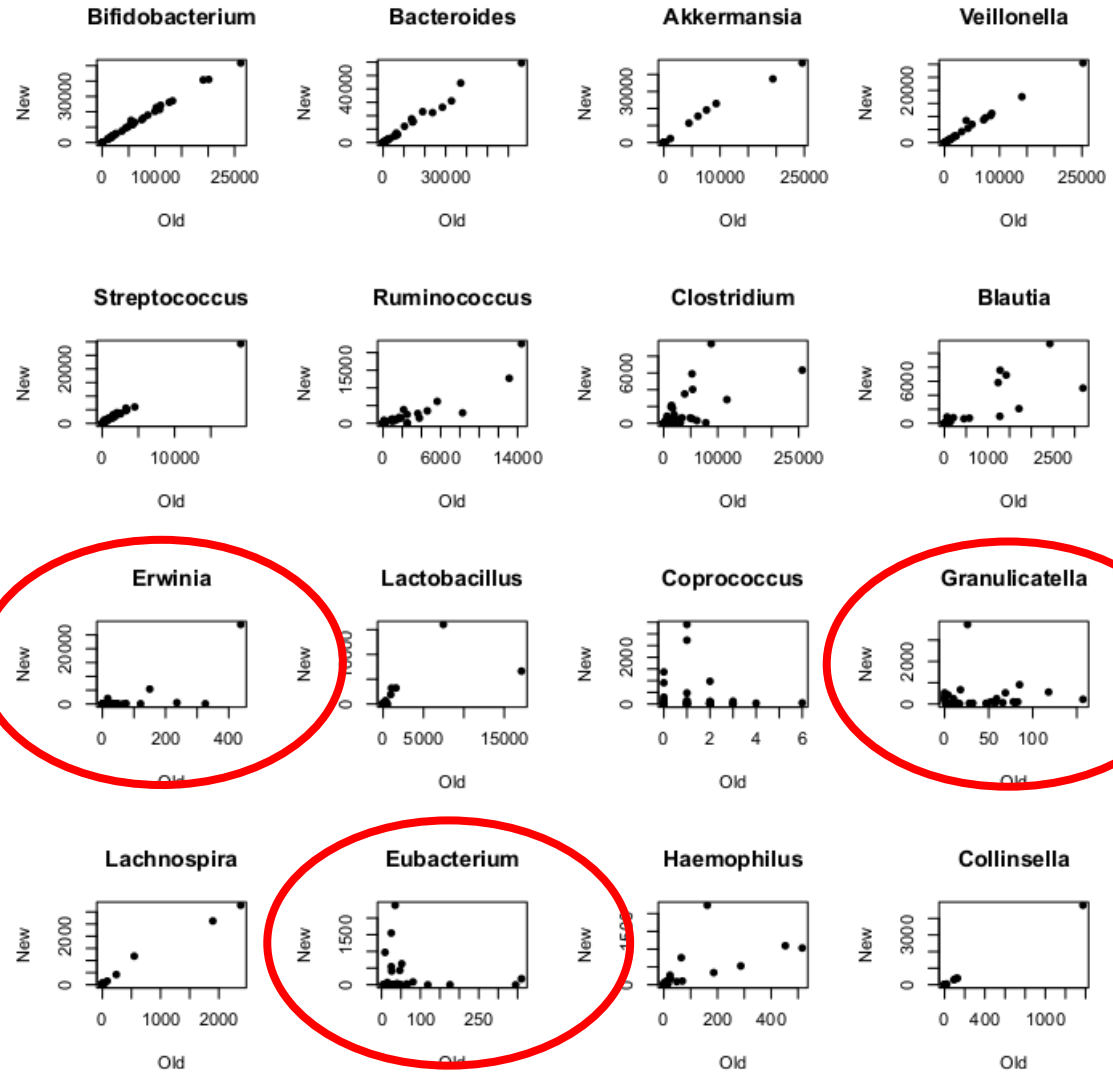


Abhängigkeit von Datenbanken

Beispiel:

taxonomische
Bestimmung
von OTUs

hier:
RDP vs. GG





COMMENTARY

Open Access

How Not to Be a Bioinformatician

Manuel Corpas^{1*}, Segun Fatumo² and Reinhard Schneider³

1. Be **open source** without being open. ... Ensure that your code is not portable, it only works in outdated operating systems and assume only you will use your application. **Take for granted that everyone will be able to understand it.**
2. Never **maintain your databases**, web services or any information that you may provide at any time. Provide unstable data, unstable models and unstable services. Your ultimate goal in data curation should be to **propagate as many errors as possible** from one database to another, while still making sure that they sound realistic.
3. Do not ever **share your results** and do not reuse. Never discuss your results before your submission has been accepted in a lost conference proceeding. Consider that the work others are doing is probably a waste of time. Ignore whatever new algorithms and methods your colleagues have developed in the last two decades.

Hervorhebungen sind nicht aus der Originalarbeit!

Worum geht es ...

Verifizierbarkeit und **Reproduzierbarkeit** sind zwei der Grundpfeiler wissenschaftlichen Arbeitens.

Verifizierbarkeit und Reproduzierbarkeit setzen voraus, dass man **Zugang zu den Daten und den prozessierenden Pipelines** hat.

Verifizierbarkeit und Reproduzierbarkeit sind nicht nur eine Frage der wissenschaftlichen Moral, sondern der Garant für die **Qualität zukünftiger Forschung**.

Auch deshalb wird von den Zuwendungsgebern zunehmend verlangt, dass Antragsteller solide **Data Management – Pläne** vorlegen.

(vgl. Data Conservancy Service der Library der John's Hopkins University)

Noch ein Hinweis zum Datenschutz ...

Forensic identification using skin bacterial communities

Noah Fierer^{a,b,1}, Christian L. Lauber^b, Nick Zhou^b, Daniel McDonald^c, Elizabeth K. Costello^c, and Rob Knight^{c,d}

^aDepartment of Ecology and Evolutionary Biology, ^bCooperative Institute for Research in Environmental Sciences, and ^cDepartment of Chemistry and Biochemistry, University of Colorado, Boulder, CO 80309; and ^dHoward Hughes Medical Institute

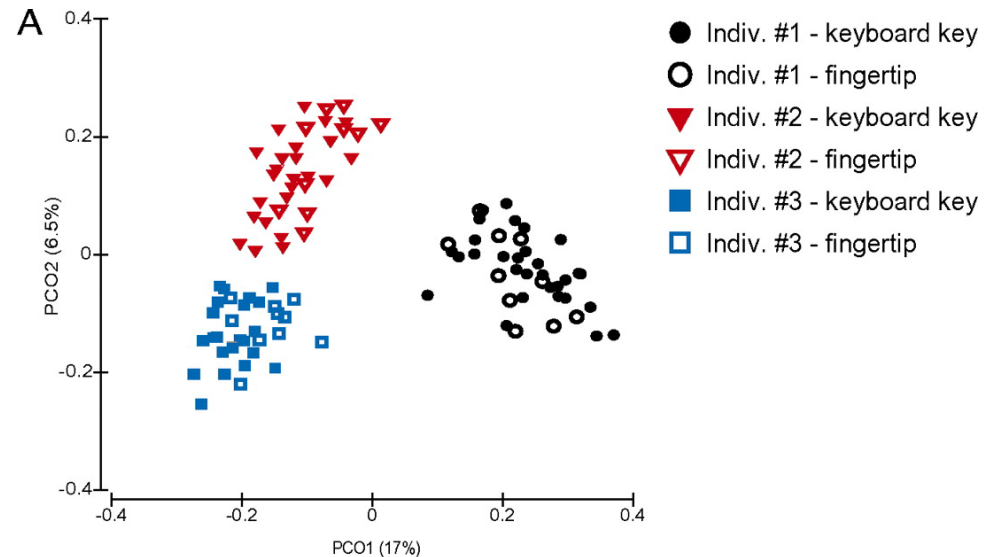
Edited by Jeffrey I. Gordon, Washington University School of Medicine, St. Louis, MO, and approved February 13, 2010 (received for review January 05, 2010)

Recent work has demonstrated that the diversity of skin-associated bacterial communities is far higher than previously recognized, with a high degree of interindividual variability in the composition of bacterial communities. Given that skin bacterial communities are personalized, we hypothesized that we could use the residual skin

studies that combine recent developments in phylogenetic community analyses (10) with high-throughput pyrosequencing methods (11). First, we compared bacterial communities on individual keys of three computer keyboards to the communities found on the fingers of the keyboard owners. Second, we examined the similarity between

SEE COMMENT

NIH: sehr restriktive
Herausgabe von
Metadaten, um
Identifizierbarkeit
zu verhindern!



Vielen Dank für Ihre Aufmerksamkeit !