

R. Kölliker: publications, grants and students

List of publications

Scientific journals

- Hersemann L, Wibberg D, Blom J, Goesmann A, Widmer F, Vorhölter F-J, **Kölliker R** (*accepted pending revisions*) Comparative genomics of host adaptive traits in *Xanthomonas translucens* pv. *graminis*. BMC Genomics
- Kempf K, Malisch CS, Grieder C, Widmer F, **Kölliker R** (*accepted*) Marker trait association analysis for agronomic and compositional traits in sainfoin (*Onobrychis viciifolia*). Genetic and Molecular Reserch
- Malisch CS, Salminen J-P, **Kölliker R**, Engström MT, Suter D, Studer B, Lüscher A (2016) Drought effects on proanthocyanidins in sainfoin (*Onobrychis viciifolia*) are dependent on the plant's ontogenetic stage. Journal of Agricultural and Food Chemistry. *in press*
- Jaenicke S, Bunk B, Wibberg D, Spröer C, Hersemann L, Blom J, Winkler A, Schatschneider S, Albaum S, **Kölliker R**, Goesmann A, Pühler A, Overmann J, Vorhölter F-J (2016) Complete genome sequence of the barley pathogen *Xanthomonas translucens* pv. *translucens* DSM 18974T / ATCC 19319 T. Genome announcements. *in press*
- Hersemann L, Wibberg D, Blom J, Widmer F, **Kölliker R** (2016) Draft genome sequence of the *Xanthomonas bromi* type strain LMG 947. Genome Announcements 4 (5), e00961-16
- Kempf K, Mora-Ortiz M, Smith LMJ, **Kölliker R**, Skøt L (2016) Characterization of novel SSR markers in diverse sainfoin (*Onobrychis viciifolia*) germplasm. BMC Genetics 17:124
- Hersemann L, Wibberg D, Widmer F, Vorhölter F-J, **Kölliker R** (2016) Draft genome sequences of three *Xanthomonas translucens* pathovar reference strains (pv. *arrhenatheri*, pv. *poae* and pv. *phlei*) with different specificities for forage grasses. Standards in Genomic Sciences 11:50
- Kempf K, Grieder C, Walter A, Widmer F, Reinhard S, **Kölliker R** (2015) Evidence and consequences of self-fertilisation in the predominantly outbreeding forage legume *Onobrychis viciifolia*. BMC Genetics 16:117
- Last, L, Arndorfer M, Balazs K, Dennis P, Dyman T, Fjellstad W, Friedel J, Herzog F, Jeanneret P, Lüscher G, Moreno G, Kwikiriza N, Gomiero T, Pointereau P, Sarthou JP, Stoyanova S, Wolfrum S, **Kölliker R** (2014) Indicators for the on-farm assessment of crop cultivar and livestock breed diversity: A survey-based participative approach. Biodiversity and Conservation 23:3051-3071
- Birrer M, **Kölliker R**, Manzanares C, Asp T, Studer B (2014) A DNA marker assay based on high resolution melting curve analysis to distinguish species of the Festuca- Lolium complex. Mol Breed 34:421-429
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- Last L, Widmer F, Fjellstad W, Stoyanova S, **Kölliker R** (2013) Genetic diversity of natural orchardgrass (*Dactylis glomerata* L) populations in three regions in Europe. *BMC Genetics* 14:102
- Herzog F, Jeanneret P, Ammari Y, Angelova S, Arndorfer M, Bailey D, Balazs K, Baldi A, Bunce RGH, Choisis JP, Dennis P, Dyman T, Eiter S, Fjellstad W, Fraser MD, Frank T, Friedel JK, Garchi S, Gejzendorffer I, Gomiero T, Jerkovich G, Jongman RHG, Kainz M, Kakudidi E, Kelemen E, **Kölliker R**, Kwikiriza N, Kovacs-Hostyanszki A, Last L, Lüscher G, Moreno G, Nkwiine C, Opio J, Oschatz ML, Paoletti MG, Pointerau P, Riedel S, Sarthou JP, Schneider M, Siebrecht N, Sommaggio D, Stoyanova S, Szerencsits E, Targetti S, Viaggi D, Wilkes J, Wolfrum S, Yashchenko S (2013) Measuring Farmland Biodiversity. *Solutions* 4:52-58
- Wichmann F, Vorhölter F-J, Hersemann L, Widmer F, Blom J, Niehaus K, Reinhard S, Conradin C, **Kölliker R** (2013) The non-canonical type III secretion system of *Xanthomonas translucens* pv. *graminis* is essential for forage grass infection. *Mol Plant Pathol* 14:576-588
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- Amini F, Mirlohi AF, Majidi M, ShojaieFar S, **Kölliker R** (2011) Improved polycross breeding of tall fescue through marker based parental selection. *Plant Breed* 130:701-707
- Bartoš J, Sandve SR, **Kölliker R**, Kopecký D, Němcová P, Stočes S, Kilian A, Rognli OA, Doležel J (2011) Genetic mapping of DArT markers in the *Festuca-Lolium* complex and their use in freezing tolerance association analysis. *Theor Appl Genet* 122:1133-1147
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Book chapters

- Kölliker R**, Knorst V, Studer B, Boller B (2016) Single-marker assisted introgression of crown rust resistance in an Italian ryegrass breeding program. In: I. Roldán-Ruiz et al. (eds) *Breeding in a World of Scarcity*. Springer International Publishing, Switzerland. 163-167
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- Last L, Boller B, Widmer F, **Kölliker R** (2014) Influence of management and habitat on genetic and phenotypic diversity of *Dactylis glomerata*. In: D. Sokolovic et al. (eds) *Quantitative Traits Breeding for Multifunctional grasslands and turf*. Springer Science+Business Media Dordrecht,
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- Wichmann F, Widmer F, Vorhölter F-J, Boller B, **Kölliker R** (2012) Breeding for resistance to bacterial wilt in ryegrass: insights into the genetic control of plant resistance and

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Other publications

Kölliker R, Boller B (eds) (2016) Plant Breeding: the Art of Bringing Science to Life. Abstracts of the 20th Eucarpia General Congress, Aug 29 – Sep 1, Zurich, Switzerland

Kölliker R, Last L, Herzog F, Widmer F (2014) Genetische Diversität in der Landwirtschaft. Agrarforschung Schweiz 5:12-19

Kölliker R, Wichmann F, Vorhölter F-J, Conradin C, Reinhard S, Boller B, Widmer F (2013) Bakterienwelke – eine rätselhafte Krankheit von Futtergräsern. Agrarforschung Schweiz 4:32-39

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Hartmann M, Fließbach A, **Kölliker R**, Enkerli J, Dubois D, Widmer F (2006). Anbausysteme beeinflussen Bodenbakterien. *Agrarforschung* 13: 494-499.

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Kölliker R (1998) Genetic variability in *Festuca pratensis* Huds.: effect of management in permanent grassland and comparison of cultivars to other species. PhD thesis Swiss Federal Institute of Technology, Zürich

Carlen C, Gex P, **Kölliker R** (1998) Permanent meadow in mountain regions: effects of management on forage quality, dry matter production of the sward, botanical composition and genetic variability of natural populations. *Herba* 11:17-23

Presentations at conferences

Oral presentations

Kölliker R, Malisch C, Kempf K, Lüscher A (2016) Improving performance and tannin content of the forage legume sainfoin (*Onobrychis viciifolia*). *Plant Breeding: the Art of Bringing Science to Life: 20th Eucarpia General Congress*, Aug 29 – Sep 1, Zurich, Switzerland

Knorst V, Byrne S L, Asp T, Studer B, Widmer F, **Kölliker R** (2016) Wisdom of crowds: pooled sequencing identifies genomic regions associated with disease resistance in ryegrass. *Plant Breeding: the Art of Bringing Science to Life: 20th Eucarpia General Congress*, Aug 29 – Sep 1, Zurich, Switzerland

Kölliker R* (2015) Bacterial wilt in pastures: unraveling the virulence of *X. translucens* pv. *graminis*. *Symposium on plant-pathogenic Xanthomonads*. Université Catholique de Louvain. Nov 20, Louvain-la-Neuve, BE

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- Birrer M, Widmer F, **Kölliker R** (2015) Separation of endophytic and epiphytic phyllosphere bacterial communities of *Lolium* spp. 10th International Symposium on Phyllosphere Microbiology, Ascona, Switzerland, July 19-23
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Patent Application

Forster J, **Kölliker R** (Inventors) Title: Molecular markers in clovers. Applicant: Agriculture Victoria Services Pty. Ltd. Application Number: 509194. Filing date: 3 January 2001. Priority claimed: PQ4907 dated 24 December 1999 and PQ6520 dated 28 March 2000

Project Funding

- 2016 – 2020 "Genomic methods to detect genetic diversity in grassland" Swiss Federal Office for Agriculture (343'000.--)
- 2014 – 2018 "Composition and putative function of the microbiome of forage grasses" Agroscope Research Programme "Microbial Biodiversity" (207'000.--)
- 2012 – 2015 LegumePlus^{Plus} - EU FP7-PEOPLE-2011-ITN ("Optimising plant polyphenols in legumes for ruminant nutrition plus health plus environmental sustainability"; leader wp4)
- 2012 – 2015 "Bacterial wilt in ryegrass: targeted characterisation of virulence factors and resistance genes", SNF No. 31003A_13858 (Fr. 438'000)
- 2009 - 2012 BioBio - Indicators for biodiversity EU FP 7 Project 2271611 (Development and Application of indicators for genetic diversity in grassland and crop species; task group leader; Fr. 150'000)
- 2007 – 2010 "Genetic and morphophysiological characterization of the *Xanthomonas translucens* pv. graminis - *Lolium multiflorum* interaction" (PhD thesis Fabienne Wichmann), SNF No. 3100A0-112582 (Fr. 296'000)
- 2005 JSPS Invitation Fellowship Program for Research in Japan (Short-Term) of the Japan Society for the Promotion of Science
- 2004 – 2008 "Molecular and phenotypic diversity of Swiss *Festuca pratensis* Huds. And *Lolium multiflorum* Lam. ecotype populations from contrasting permanent grassland habitats" (PhD thesis Madlaina Peter-Schmid) , Swiss Federal Office for Agriculture (Fr. 130'000)
- 2003 – 2006 "Genetic characterization of soil bacterial communities in the DOK long-term agricultural field experiment" (PhD thesis Martin Hartmann), SNF No. 31003A-100811 (Fr. 162'000)
- 2002 – 2006 "Molecular characterization of resistance to bacterial wilt in Italian ryegrass (*Lolium multiflorum* Lam.)" (PhD thesis Bruno Studer), SNF No. 3100-065417 (Fr. 197'000)
- 2001 – 2006 "Genetic characterisation of Mattenkleee landraces and cultivars" (PhD thesis Doris Herrmann), Swiss Federal Office for Agriculture (Fr. 130'000)
- 1998 Fellowship for prospective researchers (SNF) for the project "Development of simple sequence repeat (SSR) loci for marker assisted breeding in white clover"

Students supervised

PhD theses

- Miguel Loera (2016 – 2020, ETH Zurich) Genomic methods to detect genetic diversity in grassland
- Martina Birrer (2014 – 2018, University of Zurich) The leaf microbiome of *Lolium* spp.
- Verena Knorst (2012 – 2017, University of Zurich) Targeted characterisation of resistance genes in *Lolium multiflorum*
- Katharina Kempf (2012 – 2016, ETH Zurich) Development of molecular tools for targeted improvement of sainfoin (*Onobrychis viciifolia*)
- Lena Hersemann (2012 – 2016, University of Zurich) Characterisation of virulence factors in *Xanthomonas translucens* pv. *graminis*
- Luisa Last (2009-2013, ETH Zurich) Plant genetic diversity in conventional and organic agriculture
- Fabienne Wichmann (2007-2011, University of Zurich) Genetic and morphophysiological characterization of the *Xanthomonas translucens* pv. *graminis* – *Lolium multiflorum* interaction
- Bruno Studer (2002-2006, University of Zurich) Molecular characterisation of resistance to bacterial wilt and crown rust in Italian ryegrass (*Lolium multiflorum* Lam.)
- Doris Herrmann (2001 – 2005, University of Zurich) Characterisation of genetic diversity and molecular dissection of seed yield and persistence in Swiss Mattenklees (*Trifolium pratense* L.)
- Madlaina Schmid (2003 - 2008; co-supervisor, ETHZ) Molecular and phenotypic diversity of Swiss *Festuca pratensis* Huds. and *Lolium multiflorum* Lam. ecotype populations from contrasting permanent grassland habitats
- Martin Hartmann (2003-2007; co-supervisor, ETHZ) Genetic characterization of soil bacterial communities in the DOK long-term agricultural field experiment – Influences of management strategies and crops
- Irene Jacob (visiting PhD student 2011, Bavarian State Research Center for Agriculture, Germany) Genetic characterisation of anthracnose resistance in red clover
- Fatemeh Amini (visiting PhD student 2009-2010, Isfahan University, Iran) Genetic characterisation of tall fescue breeding germplasm
- Marja Petrova (visiting PhD student 2007-2008, Institute of Plant Genetic Resources, Sadova, Bulgaria) Genetic diversity of Swiss and Bulgarian meadow fescue populations
- Mahdi Majidi (visiting PhD student 2006-2007, Isfahan University, Iran) Influence of ex situ conservation on genetic diversity of meadow fescue

Bachelor / master theses

- Milena Scandella (Master thesis University of Basel, 2016-2017) "Anthracnose resistance in red clover"
- Magdalena Wey (Bachelor thesis ETHZ 2016) "Genetic diversity of sainfoin"
- Luca Costa (Bachelor Thesis ETHZ 2013) „Genetische Untersuchungen des Polyphenol-Stoffwechselweges in *Onobrychis viciifolia*
- Severin Kislinger (Bachelor Thesis ZHAW 2013) Molekulargenetische Charakterisierung des Raigras-Pathogens *Xanthomonas translucens* pv. *graminis*
- Sara Lüscher (Master Thesis ETHZ 2011) Characterization of *Pantoea* spp. associated with forage grasses

Denise Portmann (Semester Thesis ETHZ 2009) Genetic characterisation of Italian ryegrass genotypes with varying levels of resistance to bacterial wilt
Constanze Conradin (Semester Thesis ETHZ 2009) Generation and characterisation of hrp mutants of *Xanthomonas translucens* pv. *graminis*
Bernhard Müller (Master Thesis University of Zurich 2006-2007) Race specificity of *Xanthomonas translucens* pv. *graminis*
Salome Schneider (Diploma Thesis ETHZ 2006) Genetic diversity of *Passiflora* spp.
Beat Reidy (Diploma Thesis ETHZ 1997) Genetic variability of forage grasses - comparison of cultivars and species
Pierre Berset (Semester Thesis ETHZ 1995) Variability of meadow fescue ecotypes

Trainees

Nino Giacomelli (2013) The role of silicon in disease resistance of ryegrasses
Marius Liesch (2009) Genetic characterisation of *Lolium multiflorum* x *Xanthomonas translucens* pv. *graminis* Interaction
Sebastiano Pron (2007) Analysis of genetic diversity in Kudzu (*Pueraria* spp.)
David Schneider (2004/05) Genetic diversity of *Plantago lanceolata* populations
Markus Rechsteiner (Nachdiplompraktikum 2003/04) Analysis of gene expression in Italian ryegrass during bacterial wilt infection
Christine Creton (Nachdiplompraktikum 2003) Genetic characterisation of *Centaurea jacea* genotypes with varying sensitivity to ozone
Rolf Krähenbühl (2001/02) Genetic diversity of the plant pathogen *Xanthomonas translucens* pv. *graminis*