



P. Knochel

The author presented on this page has published more than **65 articles** since 2000 in *Angewandte Chemie*, most recently:

"Direct Pd-Catalyzed Cross-Coupling of Functionalized Organoaluminum Reagents": K. Groll, T. D. Blümke, A. Unsinn, D. Haas, P. Knochel, *Angew. Chem.* **2012**, 124, 11319–11323; *Angew. Chem. Int. Ed.* **2012**, 51, 11157–11161.

Paul Knochel

Date of birth:	November 15, 1955
Position:	Professor of Organic and Organometallic Chemistry, Ludwig-Maximilians-Universität, Munich
E-mail:	Paul.Knochel@cup.uni-muenchen.de
Homepage:	http://www.knochel.cup.uni-muenchen.de/
Education:	1972–1979 École Nationale Supérieure de Chimie de Strasbourg (ENSCS) 1979–1982 PhD with Professor D. Seebach, ETH Zurich 1982–1986 CNRS Chargé de recherche with Professor J.-F. Normant, Université Pierre et Marie Curie, Paris
Awards:	1986–1987 Postdoctoral research with Professor M. F. Semmelhack, Princeton University 2004 Dr. Paul Janssen Prize for Creativity in Organic Synthesis; 2005 Cope Scholar Award of the American Chemical Society, 2007 Lilly European Distinguished Lectureship Award; 2009 Karl Ziegler Prize; 2011 EROS (Encyclopedia of Reagents for Organic Synthesis) Best Reagent Award; 2012 Nagoya Gold Medal of Organic Chemistry
Current research interests:	Development of organometallic reagents and methods for use in organic synthesis, asymmetric catalysis, and natural product synthesis
Hobbies:	Piano, literature, music, photography

If I won the lottery, I would ... buy a Steinway for me and a house for my Steinway.

My favorite place on earth is ... Paris.

I chose chemistry as a career because ... it is like playing all the time.

My not-so-secret passions are ... literature and music.

If I were not a scientist, I would be ... a pianist.

The downside of my job is ... dealing with an increasing number of administrative duties.

A good work day begins with ... a good piece of music in my car.

My favorite authors are ... Michel de Montaigne, Marcel Proust, Georges Simenon, Noam Chomsky, and Fernando Pessoa. I cannot choose between them since I have read works by these authors over and over again for 40 years.

My favorite food is ... all the food cooked by my wife Marion, and especially Alsatian Dampfnudeln (steamed yeast dumplings; savory and not sweet!)

My favorite pieces of music are ... at least three: the Piano Concerto No. 21 in C Major KV 467 by Wolfgang A. Mozart, the Piano Concerto No. 3 by Bela Bartók, and the Piano Sonata No. 23 in F Minor Op. 57 "Appassionata" by Ludwig van Beethoven.

My favorite smell is ... the first pipe of the day.

What is the biggest challenge facing young chemists today?

The biggest challenge for a young chemist should be to realize what he or she has in their mind and heart, despite all the fashions and financial difficulties. This was true in the past and will be true in the future.

Can you recommend any exercise that increases a student's creativity?

For an organic chemistry student, I would recommend reading recent chemistry literature on natural product syntheses and synthetic methodology and creatively making variations on it.

What motivates you to be your best?

What motivates me are my graduate students. I spend nights thinking of the best experiments and the best research projects to tackle so that they all can write a beautiful PhD thesis.

What do you wish you spent more time doing?

I wish I had free time for learning more about other fields. Like the famous Russian physiologist Ivan Pavlov (Nobel Prize in Physiology and Medicine, 1904) said "Resting is best done by changing occupations".

Where do you find inspiration?

Scientific discussions with my co-workers are most stimulating for me and often generate new exciting

ideas. I find most inspiration in our common group meetings.

How do you define success?

If I feel that we have solved a challenging chemical problem that I always wanted to solve, then I feel most successful.

How do you know when to continue holding on or to let go when a difficult project doesn't seem to work out?

When I feel that the co-worker and I cannot design new experiments to solve our chemical problem in brainstorming meetings, then we may drop the project. Rarely, I come back to a dropped research project, but would then do so from a very different perspective.

My 5 top papers:

1. "Nucleophilic Catalysis of the Iodine–Zinc Exchange Reaction: Preparation of Highly Functionalized Diaryl Zinc Compounds": F. F. Kneisel, M. Dochnahl, P. Knochel, *Angew. Chem.* **2004**, *116*, 1032–1036; *Angew. Chem. Int. Ed.* **2004**, *43*, 1017–1021. The first reported catalysis of a halogen–metal exchange reaction. Later, based on this first paper, we have developed the very successful reagent *i*PrMgCl–LiCl and several related important reagents.
2. "Highly diastereoselective C_{sp^3} – C_{sp^2} Negishi cross-coupling with 1,2-, 1,3- and 1,4-substituted cycloalkyl-zinc compounds": T. Thaler, B. Haag, A. Gavryushin, K. Schober, E. Hartmann, R. M. Gschwind, H. Zipse, P. Mayer, P. Knochel, *Nature Chem.* **2010**, *2*, 125–130. A quite general method for performing diastereoselective cross-couplings between $C(sp^3)$ centers and $C(sp^2)$ centers. It is a highly selective reaction that has inspired us for finding several new coupling methods.
3. "Lewis Acid-Triggered Selective Zincation of Chromones, Quinolones, and Thiochromones: Application to the Preparation of Natural Flavones and Isoflavones": L. Klier, T. Bresser, T. A. Nigst, K. Karaghiosoff, P. Knochel, *J. Am. Chem. Soc.* **2012**, *134*, 13584–13587. Metalations with tmp-zinc bases (tmp = 2,2,6,6-tetramethylpiperidine) are remarkable for their chemo- and regioselectivity. This is beautifully demonstrated by my

What do you consider being the most important skill an organic chemist should have?

The biggest advances in organic chemistry are often of an experimental nature. Therefore, the most important skill of an organic chemist is to have good hands in the laboratory. Of course, a good mind doesn't hurt!

What type of person angers you the most?

People who never entered a research laboratory talking about the future of science and organizing research.

The interview questions were provided by Meike Niggemann (RWTH Aachen).

co-workers in the functionalization of oxygenated six-membered heterocycles.

4. "Highly Selective Metalations of Pyridines and Related Heterocycles Using New Frustrated Lewis Pairs or tmp-Zinc and tmp-Magnesium Bases with $BF_3 \cdot OEt_2$ ": M. Jaric, B. A. Haag, A. Unsinn, K. Karaghiosoff, P. Knochel, *Angew. Chem.* **2010**, *122*, 5582–5586; *Angew. Chem. Int. Ed.* **2010**, *49*, 5451–5455. The compatibility of strong Lewis acids such as $BF_3 \cdot OEt_2$ with strong Lewis bases like tmpMgCl–LiCl is really unexpected. They form an "high-energy" frustrated Lewis pair. My co-worker applied it to a very effective regioselective metalation of pyridines.
5. "Improved Air-Stable Solid Aromatic and Heterocyclic Zinc Reagents by Highly Selective Metalations for Negishi Cross-Couplings": C. I. Stathakis, S. Bernhardt, V. Quint, P. Knochel, *Angew. Chem.* **2012**, *124*, 9563–9567; *Angew. Chem. Int. Ed.* **2012**, *51*, 9428–9432.

Organozinc compounds have followed me throughout my scientific career. Their compatibility with functional groups is amazing. In this paper, we showed that organozinc pivalates are stable as solids for several hours in air. What an improvement compared with diethylzinc, which burns spontaneously in air!

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The work of Paul Knochel has been featured on the cover of Angewandte Chemie:

"Iron-Catalyzed Aryl–Aryl Cross-Couplings with Magnesium-Derived Copper Reagents": I. Sapountzis, W. Lin, C. C. Kofink, C. Despotopoulou, P. Knochel, *Angew. Chem.* **2005**, *117*, 1682–1685; *Angew. Chem. Int. Ed.* **2005**, *44*, 1654–1658.