

CURRICULUM VITAE

NAME

CRAIG MARTIN CREWS

BORN

June 1, 1964, Newport News, Virginia

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<https://scholar.google.com/citations?user=0s7cqPYAAAAJ&hl=en&oi=sra>

EDUCATION AND WORK EXPERIENCE

1982-1986 **B.A., Chemistry**, University of Virginia
1986-1987 **DAAD Fellow**, Universität Tübingen, Germany
1987-1993 **Ph.D., Biochemistry**, Dept of Biochemistry & Mol. Biology, Harvard University
1993-1995 **Postdoctoral Fellow**, Dept. of Chemistry, Harvard University
1995-2007 **Asst. Prof. → Professor**, Yale, Dept of Molecular, Cellular, and Dev. Biol. (*tenured 2001*)
1998-2007 **Asst. Prof. → Professor**, Yale School of Medicine, Dept of Pharmacology
2001-2007 **Assoc. Prof. → Professor**, Yale, Dept of Chemistry
2003 **Co-Founder**, [Proteolix](#), Inc. (*sold to Onyx Pharmaceuticals, 2009*)
2003- **Executive Director**, [Yale Center for Molecular Discovery](#)
2007- **Professor**, Yale University, Depts. of MCDB, Chemistry, Pharmacology
2008- 2018 **Editor**, *Cell Chemical Biology* (formerly *Chemistry & Biology*)
2010-2019 **Lewis B. Cullman Professor** of MCDB
2010-2013 **Visiting Professor (Gast Professor)**, Universität Konstanz, Germany
2013 **Founder**, [Arvinas](#), Inc (oncology-focused biotech) (*ARVN IPO 9/27/18*)
2019- **John C. Malone Professor** of MCDB
2019 **Founder**, Halda, LLC (oncology-focused biotech)
2025 **Founder**, Quarry Thera, LLC (oncology-focused biotech)

HONORS AND AWARDS

2025 **Havinga Medal**, Havinga Foundation, Leiden University
2025 **Passano Award** (shared with Ray Deshaies), Passano Foundation
2025 **Special Achievement Award**, Lund Spring Symposium, Lund, Sweden
2024 **IUPAC-Richter Prize in Medicinal Chemistry**, International Union of Pure and Applied Chemistry
2024 **Fellow**, American Association for Cancer Research (AACR) Academy
2024 **Kimberly Prize**, Northwestern School of Medicine and the Simpson Querrey Institute for Epigenetics
2024 **Benvenuto Memorial Award**, MD Anderson Cancer Center
2024 **Emanuel Merck Lectureship Award**, Technical Uni. of Darmstadt and Merck, KGaA
2023 **Jacob and Louise Gabbay Award in Biotechnology and Medicine**, Brandeis University (shared with Ray Deshaies)
2023 **Bristol Myers Squibb Award in Enzyme Chemistry**, American Chemical Society
2022 **Connecticut Medal of Technology**, CT Academy of Science and Engineering
2021 **Honorary Doctoral Degree**, Technische Universität Dortmund, Germany

- (*doctor rerum naturalium honoris causa*)
- 2021 **Scheele Prize**, Swedish Pharmaceutical Society
 - 2020 **Heinrich Wieland Prize**, Boehringer Ingelheim Foundation
 - 2019 **John C. Malone Professor** of Molecular, Cellular, & Developmental Biology
 - 2019 **Pharmacia-ASPET Award for Experimental Therapeutics**
 - 2019 **American Cancer Society Professorship**
 - 2018 **Pierre Fabre Award for Therapeutic Innovation**
 - 2018 **Khorana Prize**, Royal Society of Chemistry
 - 2017 **Award for Outstanding Achievement in Chemistry in Cancer Research**, American Association for Cancer Research (AACR)
 - 2015 **2015 Translational Research Prize**, Yale Cancer Center
 - 2015 **Outstanding Investigator Award (R35)**, National Cancer Institute (NIH)
 - 2014 **UCB-Ehrlich Award for Excellence in Medicinal Chemistry** (European Federation of Medicinal Chemistry)
 - 2013 **Entrepreneur of the Year**, Connecticut United for Research Excellence (CURE)
 - 2013 **Fellow**, American Association for the Advancement of Science (AAAS)
 - 2011 **Senior Scholar Award**, Ellison Medical Foundation
 - 2005 **Friedrich Wilhelm Bessel Award**, Alexander von Humboldt Foundation
 - 2005 **Fellow of the Royal Society of Chemistry**
 - 1996-1998 **CaPCURE Award** (Assoc. for the Cure of Cancer of the Prostate)
 - 1996-1999 **Donaghue Foundation New Investigator Award**
 - 1996-1999 **Burroughs Wellcome Fund New Investigator Award**

PROFESSIONAL PERSONNEL TRAINED

Graduate Students (30)

Postdoctoral Associates Trained (73)

PATENTS (18) /PATENT APPLICATIONS (31)

NEW VENTURES FOUNDED

2000 **Co-Founder**, Proteolix, Inc. (*sold to Onyx Pharmaceuticals, 2009*)

2013 **Founder**, Arvinas, Inc. (<http://arvinas.com/>)

2019 **Founder**, Halda Therapeutics, LLC

2025 **Founder**, Quarry Thera, LLC

FDA APPROVED DRUGS

Carfilzomib/Kyprolis™ (July 2012) (<http://en.wikipedia.org/wiki/Carfilzomib>)

ARVINAS AND HALDA DRUG CANDIDATES CURRENTLY IN CLINICAL TRIALS

PHASE 1

ARV-393 (BCL6 Degrading PROTAC)

ARV-102 (LLRK2 Degrading PROTAC)

HLD-0915 (Androgen Receptor RIPTAC)

PHASE 2

Bavdeglutamide (ARV-110) (Androgen Receptor Degrading PROTAC)

ARV-766 (Androgen Receptor Degrading PROTAC)

PENDING FDA DECISION

Vepdegestrant (ARV-471) (Estrogen Receptor Degrading PROTAC) – Phase III completed May 2025

INVITED LECTURES (>400 TOTAL-Details Upon Request)

PLENARY/KEYNOTE LECTURES

- 1) Bohlmann Lecture, TU Berlin, November 2025
- 2) Ziegler Lecture, Max-Planck-Institut für Kohlenforschung, Mülheim an der Ruhr, 2025
- 3) National Organic Chemistry Symposium, Rensselaer Polytechnic Institute, 2025
- 4) IUPAC-Richter Prize in Med Chemistry, Lecture, EFMC-ISMIC Conference, Rome, 2024
- 5) Kimberly Prize Lecture, Northwestern University, 2024
- 6) Emanuel Merck Lectureship, Darmstadt, Germany, 2024
- 7) Benvenuto Memorial Lectureship, MD Anderson Cancer Center, 2024
- 8) Lemieux Lecture in Biotechnology, U. Alberta, Edmonton, 2023
- 9) Shaomeng Wang Drug Discovery Award Lecture, U. Michigan, 2023
- 10) Rinehart Lecture, U. Illinois Champaign-Urbana, 2022
- 11) 22nd Irving L. Schwartz Lecture, Mt. Sinai School of Medicine, 2022
- 12) Bristol Myers Squibb Lecture, UC Berkeley, 2022
- 13) Smissman Memorial Lecture, U. Kansas, 2022
- 14) Bender Distinguished Lecture in Organic Chemistry, Northwestern U., 2022
- 15) AACR-Irving Weinstein Foundation Distinguished Lecture, 2022
- 16) C.V. Ramakrishnan Lecture, U. Baroda, India, 2022
- 17) Scheele Prize Symposium, Stockholm 2021
- 18) Wieland Prize Symposium, Munich 2021
- 19) David James Lecture, University of Cambridge, 2021
- 20) VIth International Drug Discovery and Development Forum, 2020
- 21) CHAINS: The Dutch Chemistry Conference, 2020
- 22) Novartis Lecture, Scripps Research Institute, 2020
- 23) Targeted Protein Degradation Summit, 2020
- 24) Israeli Chemistry Society Annual Meeting, 2020
- 25) Terry Fox Cancer Symposium, 2019
- 26) NIH Director's Wednesday Afternoon Lecture, 2019
- 27) Targeted Protein Degradation Conference, 2019
- 28) European Protein Degradation Congress, 2019
- 29) International Chemical Biology Society Annual Meeting, 2018
- 30) Royal Society of Chemistry, 'Chemical Biology Meets Drug Discovery', 2018
- 31) Israeli Chemistry Society Medicinal Chemistry Symposium, 2018
- 32) Vienna Biocenter Ubiquitin Symposium, 2018
- 33) David Chu Lecture, U. Georgia, 2018
- 34) University Lecture, UT-Southwestern Medical Center
- 35) Lilly-Brown Lecture, Purdue University, 2017
- 36) Belleau Lecture, McGill University, 2017
- 37) Chinese Medicinal Chemistry Symposium, 2017
- 38) Virginia Drug Discovery Symposium, 2017

- 39) CHI Drug Discovery Conference, 2017
- 40) Lemieux Lecture, University of Ottawa, 2016
- 41) Discovery on Target: The Ubiquitin Proteasome System, 2016
- 42) Leopold Symposium on Drug Discovery and Translation, 2016
- 43) XXIII International Symposium on Medicinal Chemistry, 2014
- 44) XXII International Symposium on Medicinal Chemistry, 2012
- 45) Pfizer Distinguished Lecturer, Colorado State University, 2012
- 46) American Society of Pharmacognosy 2011 Meeting, 2011
- 47) European Institute of Chemistry and Biology Symposium, 2011
- 48) Vanderbilt Chemical Biology Symposium, 2010
- 49) Pfizer 2009 Worldwide Medicinal Chemistry Symposium, 2009
- 50) Biotechnology and Biological Sciences Research Council Chemical Biology Workshop, 2007
- 51) Institut de Chimie des Substances Naturelles 9th Symposium, 2004

Summaries of 10 Most Significant Publications *(Google scholar citations as of 9/14/25 in parentheses)*

1. Sakamoto, K.M., Kim, K.B., Kumagai, A., Mercurio, F., Crews, C.C., and Deshaies, R.J. (2001). PROTACs: Chimeric molecules that target proteins to the Skp1-Cullin-F box complex for ubiquitination and degradation. *Proc. Natl. Acad. Sci. USA* 98, 8554-9. (2545 citations)
First conception of PROTACs and demonstration of proof-of-concept. Notably, this paper articulated the main theoretical advantages of PROTACs that animate the field to this day.
2. Schneekloth, J.S. Jr., Fonseca, F.N., Koldobskiy, M., Mandal, A., Deshaies, R., Sakamoto, K., and Crews, C.M. (2004). Chemical genetic control of protein levels: selective in vivo targeted degradation. *J. Am. Chem. Soc.* 126, 3748-3754. (586 citations)
First demonstration of PROTACs that are cell-permeable and based on a ligand that binds to VHL. VHL remains one of the two most popular ubiquitin ligases to effect targeted protein degradation with heterobifunctional molecules.
3. Sakamoto, K.M., Kim, K.B., Verma, R., Ransick, A., Stein, B., Crews, C.M., and Deshaies, R.J. (2003). Development of PROTACs to target cancer-promoting proteins for ubiquitination and degradation. *Mol. Cell. Proteomics* 2, 1350-1358. (470 citations)
First demonstration that targeted protein degradation can be used to control stability of estrogen receptor and androgen receptor. These two receptors are the targets of the two most clinically-advanced PROTACs
4. Bondeson DP, Mares A, Smith IED, Ko E, Campos S, Miah AH, Mulholland KE, Routly N, Buckley DL, Gustafson JL, Zinn N, Grandi P, Shimamura S, Bergamini G, Faeltsh-Savitski M, Bantscheff M, Cox C, Gordon DA, Willard RR, Flanagan JJ, Casillas LN, Votta BJ, den Besten W, Famm K, Sruidenier L, Carter PS, Harling JD, Churcher I, & Crews CM (2015) Catalytic in vivo protein knockdown by small-molecule PROTACs. [Nat Chem Biol. 2015 Aug;11\(8\):611-7.](#) PMID: 26075522 doi: 10.1038/nchembio.1858. (1397 citations)
First demonstration of PROTAC-mediated in vivo degradation of drug target. The 'all small molecule' PROTACs described for the first time changed the opinion of the pharmaceutical industry- what once was a 'chemical biology curiosity' now has pharmaceutical properties that are conducive to modern medicinal chemistry and drug development.

5. Lu J, Qian Y, Altieri M, Dong , Wang J, Raina K, Hines J, Winkler JD, Crew AP, Coleman K, Crews CM (2015) Hijacking the E3 ubiquitin ligase cereblon to efficiently target BRD4. [*Chemistry & Biology* 22 \(6\), 755-763](#) (1278 citations)

First demonstration of a cereblon-based PROTAC. This class of PROTACs has favorable drug-like properties and has served as the basis for the majority of oral PROTAC drug candidates that are currently being testing in clinical trials.

6. Bond M, Chu L, Nalawansha D, Li K, Crews CM. (2020) Targeted Degradation of Oncogenic KRAS^{G12C} by VHL-recruiting PROTACs [*ACS Central Science*, 6\(8\):1367–1375](#). doi: 10.1021/acscentsci.0c00411. PMID: 32875077 (395 citations)

First demonstration that an oncogenic KRas mutant can be targeted for degradation. As a recent ‘undruggable’ target, PROTAC-mediated KRas protein is solid evidence for degradation as a new therapeutic modality capable of opening up the “Drug Target Space” in drug development.

7. Lai, AC, Toure, M, Hellerschmied, D, Salami, J, Jaime-Figueroa, S, Ko, E, Hines, J, Crews, CM (2016) Modular PROTAC Design for the Degradation of Oncogenic BCR-Abl. [*Angewandte Chemie Int. Ed. Engl.* 55: 807–810](#). PMID:26593377 (761 citations)

First demonstration that differential degradation of target proteins can be achieved via recruitment to different E3 ligases.

8. Burslem GM, Smith BE, Lai A, Jaime-Figueroa S, McQuaid D, Bondeson DP, Toure M, Dong H, Qian Y, Wang J, Crew AP, Hines J, Crews CM (2018). The Advantages of Targeted Protein Degradation over Inhibition: a RTK Case Study [*Cell Chemical Biology*. 25:67-77](#). PMID:29129716 (694 citations)

First demonstration of ‘differential biology’, i.e., the advantages one can achieve via degrading a target protein versus simply inhibiting it. These study showed that not only the enzymatic activity but also the scaffolding role of kinases can be targeted therapeutically.

9. Bondeson DP, Smith BE, Burslem GM, Buhimschi AD, Hines J, Jaime-Figueroa S, Wang J, Hamman B, Ishchenko A, Crews CM. (2018) Lessons in PROTAC Design from Selective Degradation with a Promiscuous Warhead [*Cell Chemical Biology* 25\(1\):78-87](#). PMID:29129718 (913 citations)

First demonstration that increased target protein selectivity can be gained via the neo-Protein:Protein Interface (PPI) that is inherent to potent PROTACs.

10. Smith BE, Wang SL, Jaime-Figueroa S, Harbin A, Wang J, Hamman BD, Crews CM. (2019). Differential PROTAC substrate specificity dictated by orientation of recruited E3 ligase. [*Nat Commun.* Jan 10;10\(1\):131](#). PMID:30631068 (535 citations)

First demonstration that the presentation of the target protein to the E3 ligase can dictate substrate specificity for degradation. Using the same recruiting substrate ligand and the same E3 ligase ligand, we showed that changing the geometry of their coupling changes the degradation specificity for related kinase family members.

TOTAL PUBLICATIONS: 192 H-Index: 114 (Google Scholar)

- (1) Alcorta D, CM Crews, LJ Sweet, L Bankston, SW Jones, and RL Erikson. (1989) Sequence and expression of chicken and mouse rsk: homologs of *Xenopus laevis* ribosomal S6 kinase. [Mol. Cell. Biol.](#), 9:3850-3859. PMID: PMC362446
- (2) Crews CM, AA Alessandrini, and RL Erikson. (1991) Mouse Erk-1 gene product is a serine/threonine protein kinase that has the potential to phosphorylate tyrosine. [Proc. Natl. Acad. Sci. USA](#), 88:8845-8849. PMID: PMC52607
* *subject of commentary in 'The Scientist'*
- (3) Crews CM, AA Alessandrini, and RL Erikson. (1992) The primary structure of MEK, a protein kinase that phosphorylates and activates the ERK gene product. [Science](#), 258:478-480. PMID: 1411546
* *subject of commentary in 'Journal of NIH Research'*
- (4) Crews CM and RL Erikson. (1992) Purification of a murine protein-tyrosine/threonine kinase that phosphorylates and activates the Erk1 gene product: Relationship to the fission yeast byr1 gene product. [Proc. Natl. Acad. Sci. USA](#), 89:8205-8209. PMID: PMC49886
- (5) Alessandrini AA, CM Crews, and RL Erikson. (1992) Phorbol ester stimulates a protein tyrosine/threonine kinase that phosphorylates and activates the Erk1 gene product. [Proc. Natl. Acad. Sci. USA](#), 89:8200-8204. PMID: PMC49885
- (6) Calvo V, CM Crews, TA Vik, and BE Bierer. (1992) Interleukin 2 stimulation of p70 S6 kinase is inhibited by the immunosuppressant rapamycin. [Proc. Natl. Acad. Sci. USA](#), 89:7571-7575. PMID: PMC49752
- (7) Crews CM, AA Alessandrini, and RL Erikson. (1992) Erks: Their fifteen minutes has arrived. [Cell Growth and Differentiation](#), 3:135-142. PMID: 1504018
- (8) Crews CM and RL Erikson. (1993) Extracellular signals and reversible protein phosphorylation: What to MEK of it all. [Cell](#). 74:215-217. PMID: 8343948
- (9) Macdonald SG, CM Crews, L Wu, J Driller, R Clark, RL Erikson, F McCormick. (1993) Reconstitution of the raf-1-MEK-ERK signal transduction pathway in vitro. [Mol. Cell. Biol.](#), 13:6615-6620. PMID: PMC364724
- (10) Huang W, AA Alessandrini, CM Crews, RL Erikson. (1993) Raf-1 forms a stable complex with MEK1 and activates MEK1 by serine phosphorylation. [Proc. Natl. Acad. Sci. USA](#), 90:10947-10951. PMID: PMC47898
- (11) Brott BK, AA Alessandrini, DA Largaespada, NG Copeland, NA Jenkins, CM Crews, and RL Erikson. (1993) MEK2 is a kinase related to MEK1 and is differentially expressed in murine tissues. [Cell Growth Differ.](#) 4(11):921-9. PMID: 8297798

- (12) Crews CM, JL Collins, WS Lane, ML Snapper, and SL Schreiber. (1994) GTP-dependent binding of the antiproliferative agent didemnin to elongation factor 1a*. [J.Biol.Chem. 269:15411-15414](#). PMID: 8195179
* *subject of 'Chemistry and Engineering News' (CEN) commentary*
- (13) Erikson RL, AA Alessandrini, CM Crews. (1995) Mek1, Mapk/Erk Kinase The Protein Kinase Facts Book p.275-277.

- Assumed Independent Research Program at Yale University –

- (14) Crews CM, WS Lane, and SL Schreiber. (1996) Didemnin binds to the protein palmitoyl thioesterase responsible for infantile neuronal ceroid lipofuscinosis [Proc. Natl. Sci. USA, 93:4316-4319](#). PMID: PMC39533
- (15) Crews CM. (1996) Deciphering Isozyme Function: Exploring Cell Biology with Chemistry in the Post-Genomic Era [Chemistry and Biology 3:961-965](#). PMID: 9000005
- (16) Sin N, L Meng, MQW Wang, JJ Wen, WG Bornmann, and CM Crews. (1997) The anti-angiogenic agent fumagillin covalently binds and inhibits methionine aminopeptidase, MetAP-2. [Proc. Natl. Acad. Sci. USA, 94:6099-6103](#). PMID: PMC21008
* *subject of commentaries in Chemistry & Engineering News (CEN), Chemistry & Biology, Pharmacia (published by the Pharmaceutical Society of Japan)*
- (17) Wen JJ and CM Crews. (1998) Towards the semi-synthesis of Didemnin M. Solution and solid phase synthesis of a pseudotetrapeptide: pGlu-Glnψ[COO]Ala-Pro-OH. *Tetrahedron Letters*, 39 (8):779-782.
- (18) Elofsson M and CM Crews. (1998) Tightening the Nuts and Bolts. *Trends in Biotechnology*,16:147-149.
- (19) Wen JJ, and CM Crews. (1998) Synthesis of 9-Fluorenylmethoxycarbonyl Protected Amino Aldehydes. *Tetrahedron Asymmetry*, 9 (11): 1855-1858.
- (20) Sin N, L Meng, H Auth, and CM Crews. (1998) Eponemycin Analogs: Syntheses and use as probes of angiogenesis. [Bioorganic & Med.Chem.6:1209-1217](#) PMID: 9784862
- (21) Meng L, N Sin, and CM Crews. (1998) The antiproliferative agent, didemnin B, uncompetitively inhibits palmitoyl protein thioesterase. [Biochemistry 37\(29\):10488-10492](#). PMID: 9671519
- (22) Liu S, J Widom, CW Kemp, CM Crews, and J Clardy. (1998) Structure of Human Methionine Aminopeptidase-2 Complexed with Fumagillin. [Science 282:1324-1327](#) PMID: 9812898
** *subject of 'Chemistry and Engineering News' (CEN) and 'Drug Discovery and Development' commentaries*
- (23) Meng L, B Kwok, N Sin, and CM Crews. (1999) Eponemycin Exerts its Antitumor Effect through Inhibition of Proteasome Function. [Cancer Research, 59: 2798-2801](#). PMID: 10383134

- (24) Crews, CM and U Splittgerber. (1999) Chemical Genetics: Exploring and Controlling Cellular Processes with Chemical Probes. [*Trends in Biochemical Sciences*, 24:317-320.](#) PMID: 10431176
- (25) Sin N, KB Kim, M Elofsson, L Meng, H Auth, BHB Kwok, and CM Crews. (1999) Total Synthesis of the Potent Proteasome Inhibitor Epoxomicin: A Useful Tool for Understanding Proteasome Biology. [*Bioorganic & Med. Chem. Letters*, 9:2283-2288.](#) PMID: 10465562
- (26) Meng L, R Mohan, BHK Kwok, M Elofsson, N Sin and CM Crews. (1999) Epoxomicin, a Potent and Selective Proteasome Inhibitor exhibits *in vivo* Anti-inflammatory Activity. [*Proc. Natl. Acad. Sci. USA*, 96:10403-10408.](#) PMCID: PMC17900
- (27) Elofsson M, U Splittgerber, J Myung, and CM Crews. (1999) Towards Subunit specific Proteasome Inhibitors: Synthesis and Evaluation of Peptide $\alpha'\beta'$ epoxyketones. [*Chemistry & Biology*, 6:811-822.](#) PMID: 10574782
- * *subject of 'Chemistry and Engineering News' (CEN)*
- (28) Kim K, J Myung, N Sin, and CM Crews. (1999) Proteasome Inhibition by the Natural Products Eponemycin and Dihydroeponemycin: Insights into Specificity and Potency. [*Bioorg. Med. Chem. Lett.* 9:3335-3340.](#) PMID: 10612595
- (29) Groll M, K Kim, N Kairies, R Huber, and CM Crews. (2000) Crystal Structure of Epoxomicin:20S Proteasome Reveals a Molecular Basis for Selectivity of $\alpha'\beta'$ -Epoxyketone Proteasome Inhibitors. [*J.Am.Chem.Soc.*, 122:1237-1238.](#)
- * *subject of 'Chemistry and Engineering News' (CEN)*
- (30) Crews CM and R Mohan. (2000) Small-Molecule inhibitors of the Cell Cycle. [*Curr. Opin. Chem. Biol.* 4:47-53.](#) PMID: 14593706
- (31) Schwarz K, R de Giuli, G Schmidtke, S Kostka, M van den Broek, K Kim, CM Crews, R Kraft, and M Groettrup. (2000) The selective proteasome inhibitors lactacystin and epoxomicin can be used to either up- or down-regulate antigen presentation at nontoxic doses [*J. Immunology*, 164\(12\):6147-57.](#) PMCID: PMC2507740
- (32) Shotwell JB, S Hu, E Medina, M Abe, R Cole, CM Crews, and JL Wood. (2000) Efficient stereoselective synthesis of isopanepoxydone and panepoxydone: A re-assignment of relative stereochemistry. [*Tetrahedron Letters*, 41:9639-9643.](#)
- (33) Yeh J, R Mohan, and CM Crews. (2000) The Antiangiogenic Agent TNP-470 requires p53 and p21^{CIP/WAF} for Endothelial Cell Growth Arrest. [*Proc. Natl. Acad. Sci. USA*, 97:12782-12787](#) PMCID: PMC18841
- (34) Princiotta MF, U Schubert, I Bacik, JR Bennink, J Myung, CM Crews, and JW Yewdell. (2001) Cells adapted to the proteasome inhibitor 4-hydroxy- 5-iodo-3-nitrophenylacetyl-Leu-Leu-leucinal-vinyl sulfone require enzymatically active proteasomes for continued survival. [*Proc. Natl. Acad. Sci. USA*, 98\(2\):513-518.](#) PMCID: PMC14618
- (35) Myung J, K Kim, KK Lindsten, NP Dantuma, and CM Crews. (2001) Lack of Proteasome Active Site Allostery as Revealed by Subunit-Specific Inhibitors. [*Molecular Cell*, 7\(2\):411-420.](#) PMID: 11239469

- (36) Myung J, K Kim, CM Crews. (2001) The Ubiquitin-proteasome Pathway and Proteasome Inhibitors. [Medicinal Research Reviews, 21:245-273](#). PMID: PMC2556558
- (37) Kwok HB, B Koh, M Ndubuisi, M Elofsson, and CM Crews. (2001) The Anti-inflammatory Natural Product Parthenolide from the Medicinal Herb Feverfew Directly Binds to and Inhibits I κ B Kinase. [Chemistry & Biology 8\(8\):759-66](#). PMID: 11514225
- (38) Sakamoto KM, KB Kim, A Kumagai, F Mercurio, CM Crews, and RJ Deshaies. (2001) Protacs: Chimeric Molecules that Target Proteins to the Skp1-Cullin-F Box Complex for Ubiquitination and Degradation, [Proc. Natl. Acad. Sci. USA 98:8554-8559](#). PMID: PMC37474
- (39) Ndubuisi M, B Kwok, J Vervoort, M Elofsson, and CM Crews. (2002) Characterization of a Novel Mammalian Phosphatase Having Sequence Similarity to Schizosaccharomyces pombe PHO2 and Saccharomyces cerevisiae PHO13. [Biochemistry, 41\(24\):7841-8](#). PMID: PMC2556553
- (40) Shotwell JB, B Koh, M Ndubuisi, HW Choi, E Medina, JL Wood, CM Crews. (2002) Inhibitors of NF- κ B Signalling: Design and Synthesis of a Biotinylated Isopanepoxydone Affinity Reagent. [Bioorganic and Medicinal Chemistry Letters 12 \(23\): 3463-3466](#) PMID: 12419384
- (41) Shotwell JB, ES Krygowski, J Hines, B Koh, EWD Huntsman, HW Choi, JS Schneekloth Jr., JL Wood, and CM Crews. (2002) Total Synthesis of Luminacin D [Organic Letters, 5:4\(18\):3087-9](#) PMID: PMC2556570
- (42) Koh B and CM Crews. (2002) Chemical Genetics: A Small Molecule Approach to Neurobiology [Neuron 14;36\(4\):563-6](#). PMID: 12441047
- (43) Crews CM and KB Kim. (2003) Natural and Synthetic Inhibitors of the Proteasome. [Proteasome Inhibitors in Cancer Therapy](#). (J. Adams, editor)
- (44) Crews CM and JB Shotwell. (2003) Small Molecule Inhibitors of the Cell Cycle [Prog Cell Cycle Res. 5:125-33](#) PMID: 14593706
- (45) Garrett IR, G Gutierrez, G Rossini, M Zhao, KB Kim, S Hu, CM Crews, and GR Mundy. (2003) Selective inhibitors of the osteoblast proteasome stimulate bone formation *in vivo* and *in vitro*. [J Clin Invest. 111\(11\):1771-82](#). PMID: PMC156102
- (46) Yang Z-Q, B Kwok, S Lin, M Koldobskiy, CM Crews, and SJ Danishefsky. (2003) Simplified Synthetic TMC-95A/B Analogues Retain the Potency of Proteasome Inhibition [ChemBioChem 4:508-513](#). PMID: PMC2556569
- (47) Yeh J and CM Crews. (2003) Chemical Genetics: Adding to the Developmental Biology Toolbox [Developmental Cell 5\(1\):11-19](#). PMID: 12852848
- (48) Crews CM. (2003) Feeding the Machine: Mechanisms of Proteasome-catalyzed Degradation of Ubiquitinated Proteins [Curr Opin in Chemical Biology,7\(5\):534-9](#). PMID: 14580555

- (49) Sakamoto KM, K Kim, R Verma, A Ransick, B Stein, CM Crews, and RJ Deshaies. (2003) Development of Protacs to Target Cancer-Promoting Proteins for Ubiquitination and Degradation [*Mol Cell Proteomics* 2\(12\):1350-1358](#). PMID: 14525958
- (50) Brdlik C, and CM Crews. (2004) A Single Amino Acid Residue Defines the Difference in Ovalicin Sensitivity Between Type I and II Methionine Aminopeptidases. [*J.Biol.Chem.* 279:9475-80](#). PMCID: PMC2556556
- (51) Schneekloth Jr., JS, F Fonseca, M Koldobskiy, A Mandal, R Deshaies, K Sakamoto, and CM Crews. (2004) Chemical Genetic Control of Protein Levels: Selective *in vivo* Targeted Degradation [*JACS* 126\(12\):3748-54](#) PMID: 15038727
- (52) Lin S, ZQ Yang, BH Kwok, M Koldobskiy, CM Crews, SJ Danishefsky. (2004) Total synthesis of TMC-95A and -B via a new reaction leading to Z-enamides. Some preliminary findings as to SAR. [*JACS.* 126\(20\):6347-55](#). PMCID: PMC2507741
- (53) Schneekloth Jr., JS, CM Crews. (2005) Chemical Approaches to Controlling Intracellular Protein Degradation [*ChemBioChem* 6\(1\):40-6](#). PMCID: PMC2556563
- (54) Kim KB, F Fonseca, CM Crews. (2005) Development and Characterization of Proteasome Inhibitors [*Methods in Enzymology* \(399\):585-609](#). PMCID: PMC2556561
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