

The Diffusion of Nanotechnology Knowledge in Turkey

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Structure of the Paper

- Introduction
- Literature Review
- Research Questions
- Methods
- Findings
- Discussion and Conclusion

Introduction

- Turkey identified nanotechnology as a key field early as 2003.
- More than 20 nanotechnology research centers in Turkey
- More than 2,000 researchers and 2,500 papers in 2014
- Multidisciplinary nanotechnology degrees in universities
- Vision 2023 Technology Foresight Study supports nanotechnology research among others.
- Huge governmental investment in universities and research centers
- European countries under the 7th Framework have heavily invested on nano-technology

Literature Review

- Applying Rogers' theory of diffusion of innovation in the process of knowledge diffusion
- Longevity is an important element in diffusion process
- Temporal and topological diffusion of knowledge
- Information scientists use bibliometrics and Social Network Analysis (SNA)
- Derek de Solla Price pioneered the study of the scholarly communication process between scientists

Research questions

- The most prolific universities publishing nanotechnology research in Turkey
- The rate of diffusion of nanotechnology knowledge and its adoption within universities between 2000 and 2011 in Turkey
- Key areas of nanotechnology research in Turkey

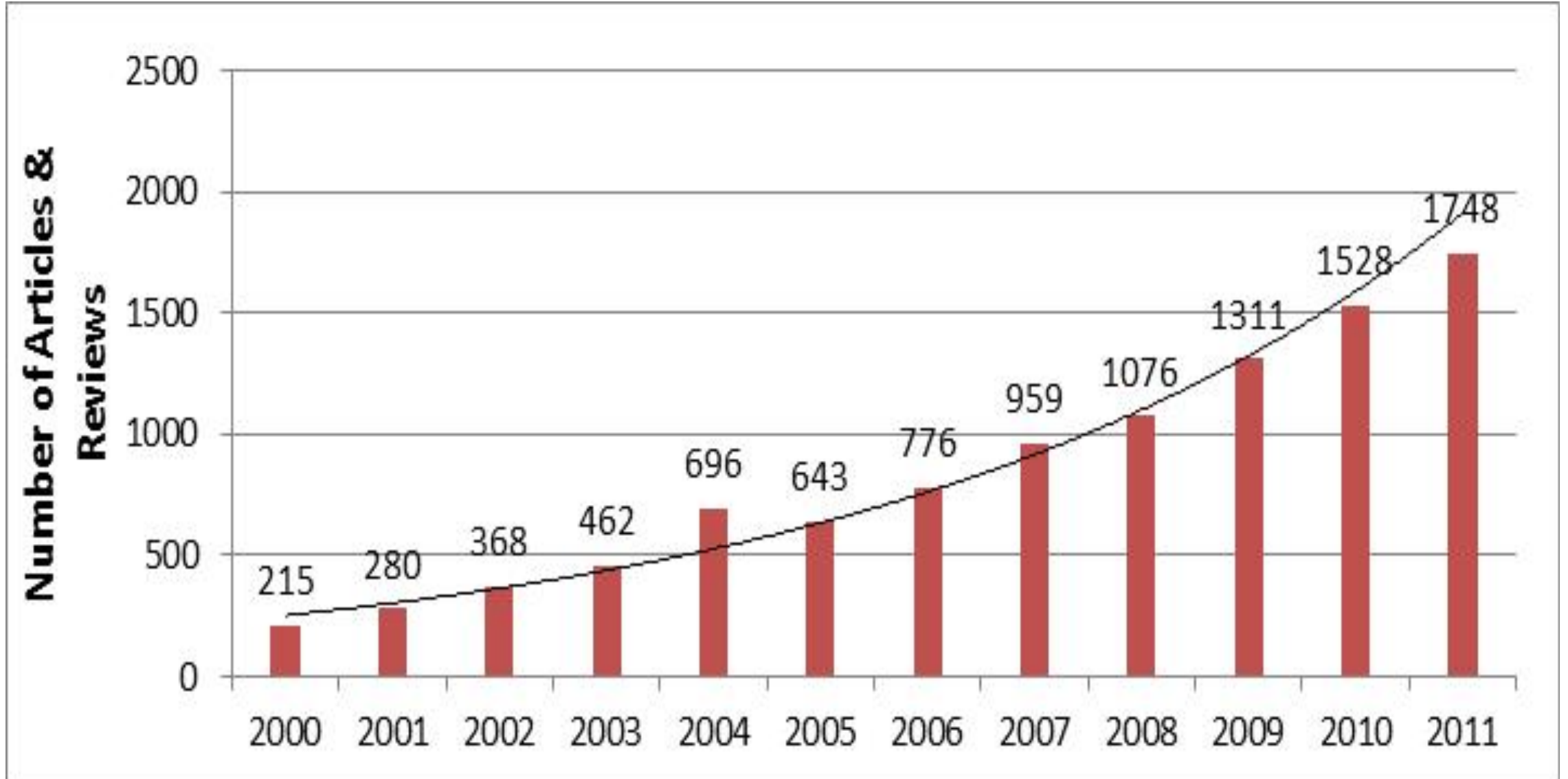
Methods

- Retrieved a total of 10,062 nanotechnology records from WoS (2000-2011)
- Analyzed them in two equal periods (2000-2005 and 2006-2011)
- Identified the top 15 most prolific universities based on frequency and co-occurrences
- A geocoder was used to get the geo-coordinates for each city and Google Maps
- overlay the relationships among cities on a geographic map.
- Used Bibexcel, VoSviewer, Gephi and Pajek.

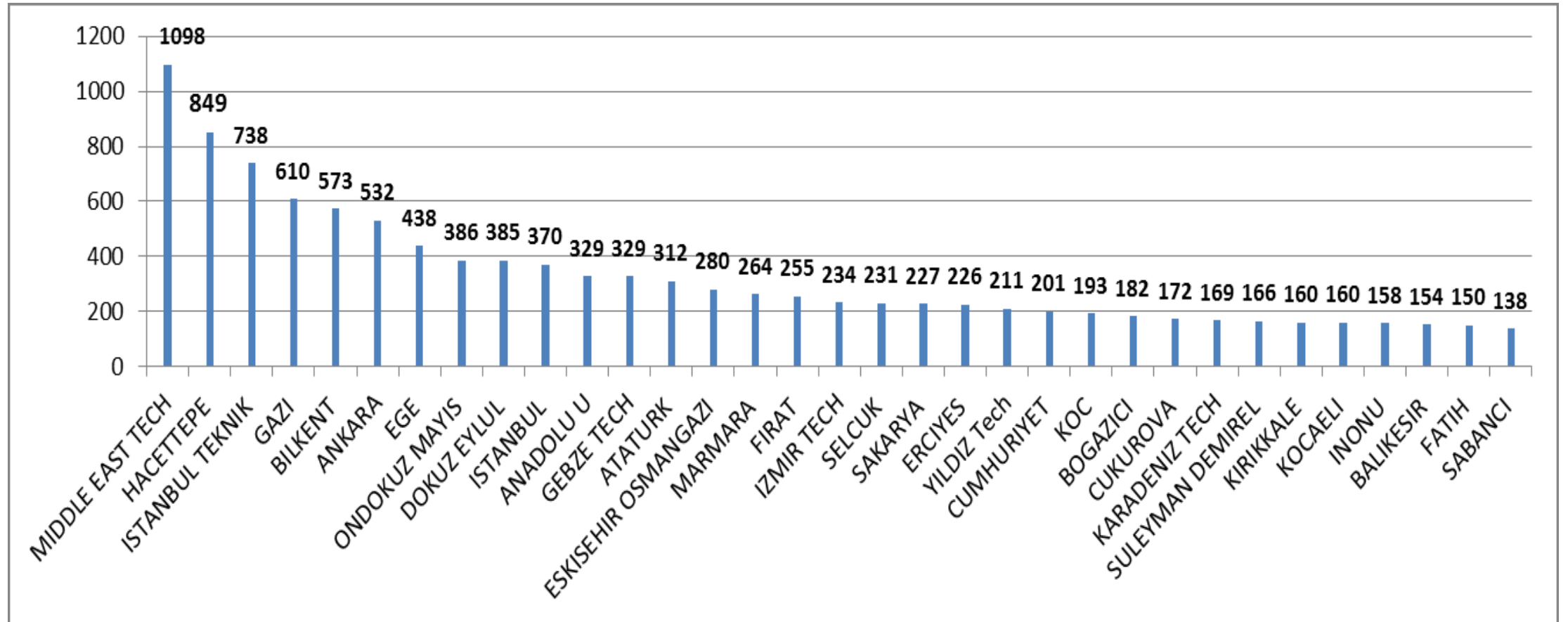
Findings

Number of nanotechnology publications in Turkey (2000-2011)

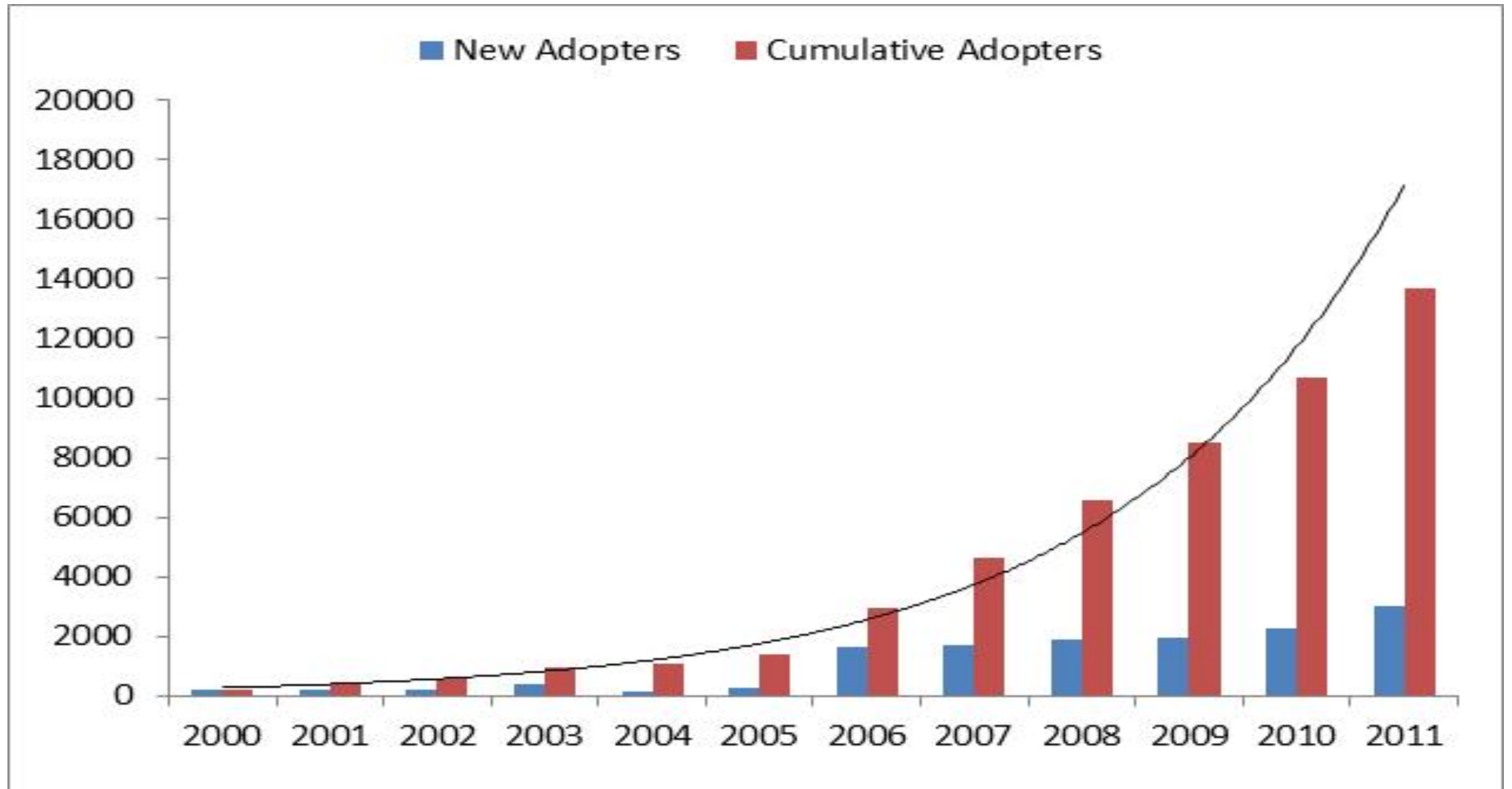
Source: Thomson's ISI Web of Science as of November 2013



The top universities graph

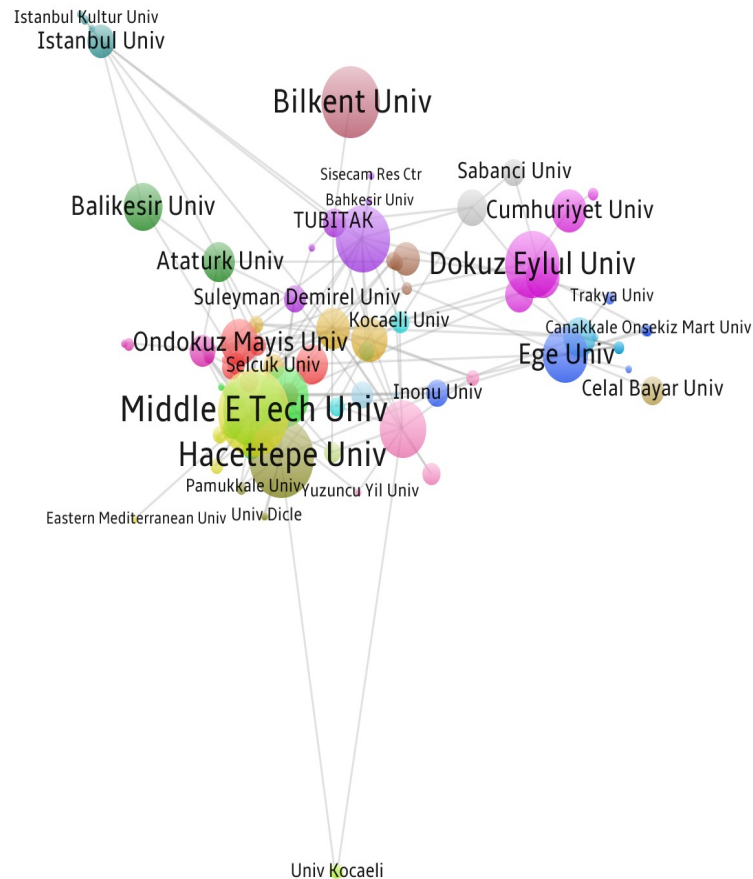


Adoption rate of collaborations (2000-2011)

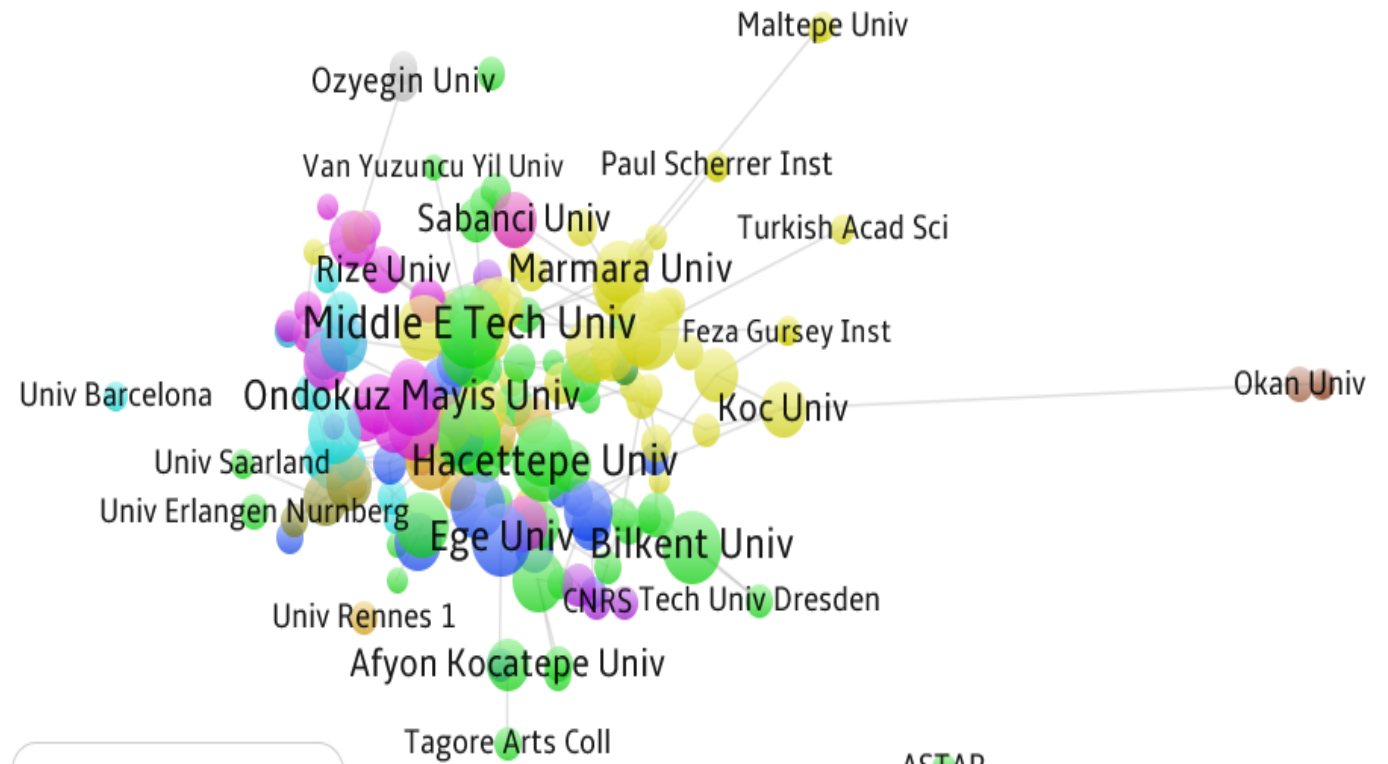


Collaboration on nanotechnology

2000-2005



2006-2011



The most prolific Turkish scholars in nanotechnology (2000-2011) Source: WoS (as of November 2013)

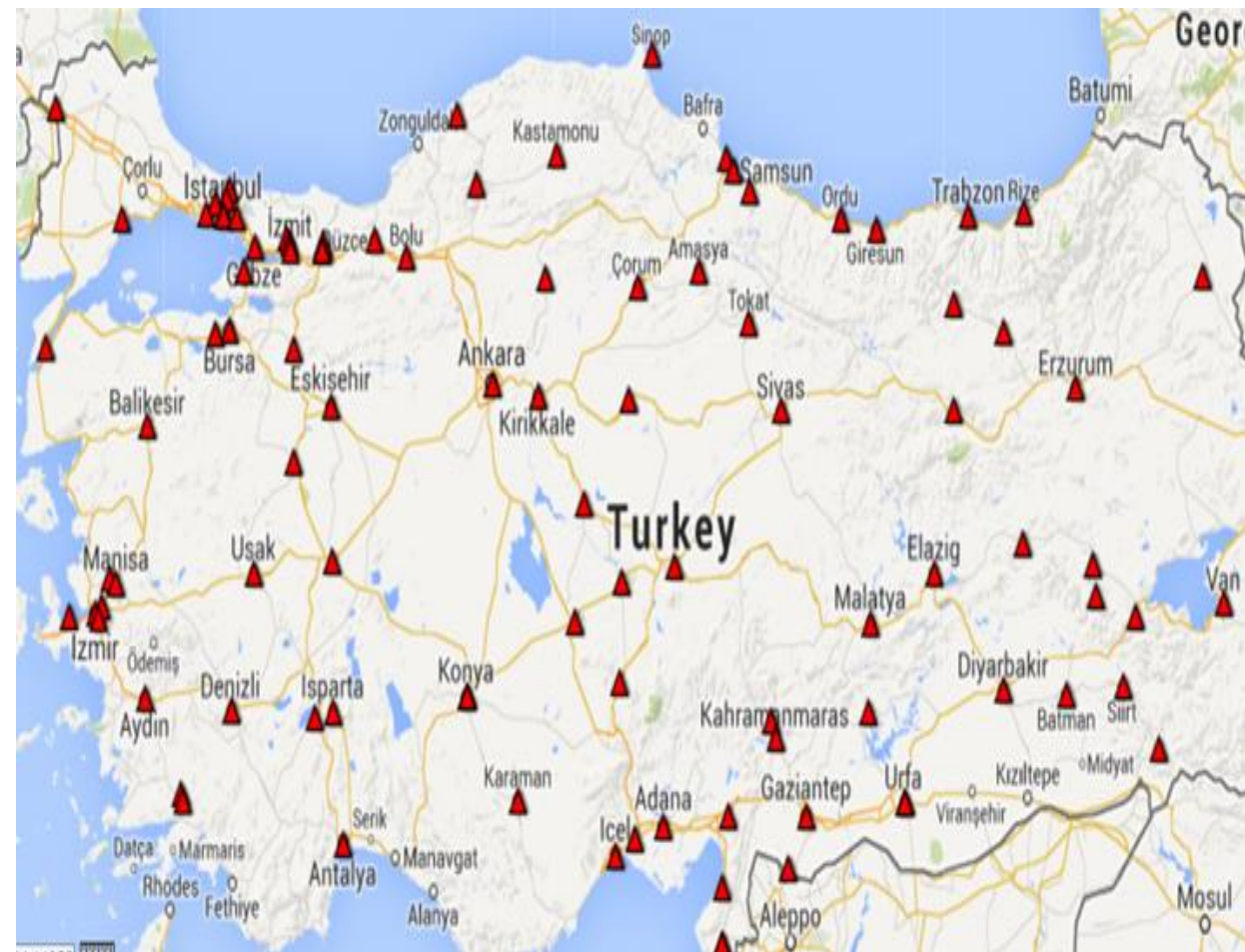
2000-20005			2006-2011		
N	First author & affiliation	# of co- authors	N	First author & affiliation	# of co-authors
53	Erkoc S (METU)	29	149	Buyukgungor O (Ondokuz Mayıs)	37
49	Sokmen I (Dokuz Eylül)	16	78	Yagci Y (ITU)	19
42	Ciraci S (Bilkent)	13	75	Denizli A (Hacettepe)	18
39	Denizli A (Hacettepe)	12	72	Yakuphanoglu F (Firat)	28
38	Yagci Y (ITU)	10	67	Ozkar S (METU)	23
37	Celik E (Bilkent)	11	67	Toppare L (METU)	15
37	Sari H (Bilkent)	11	64	Ozbay E (Bilkent)	13
36	Turker L (METU)	28	62	Yesilel OZ (Osmangazi)	17
30	Yilmaz VT (Dokuz Eylül)	8	61	Sokmen I (Dokuz Eylül)	17
30	Toppare L (METU)	7	58	Ozcelik S (Gazi)	12
29	Hascicek YS (Gazi)	8	52	Demir HV (Bilkent)	13
28	Ovecoglu ML (ITU)	7	49	Baykal A (Bilkent)	10
27	Elmalı A (Ankara)	8	45	Turan R (METU)	10
26	Elerman Y (Ankara)	8	44	Sahin E (Bilkent)	11
26	Piskin E (Hacettepe)	8	44	Yilmaz VT (Dokuz Eylül)	13
26	Kasapoglu E (Cumhuriyet)	8	43	Caykara T (Gazi)	15
26	Balkan N (Bilkent)	5	41	Sari H (Ankara)	9
22	Yilmaz F (METU)	6	40	Ciraci S (Bilkent)	12
22	Turan S (Marmara)	8	39	Kasapoglu E (Cumhuriyet)	12
22	Ozbay E (Bilkent)	5	39	Albayrak C (Ondokuz Mayıs)	11

Geographical distribution

2000-2005

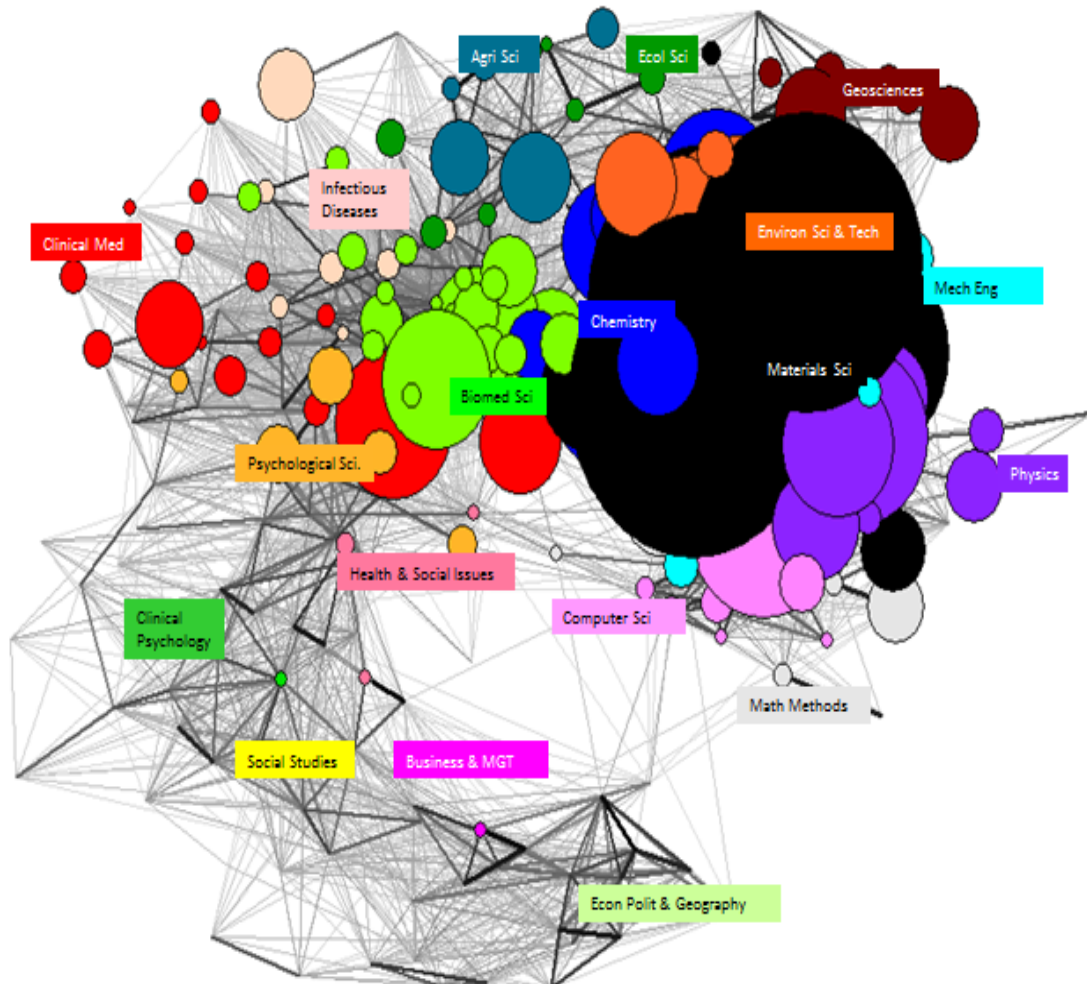


2006-2011

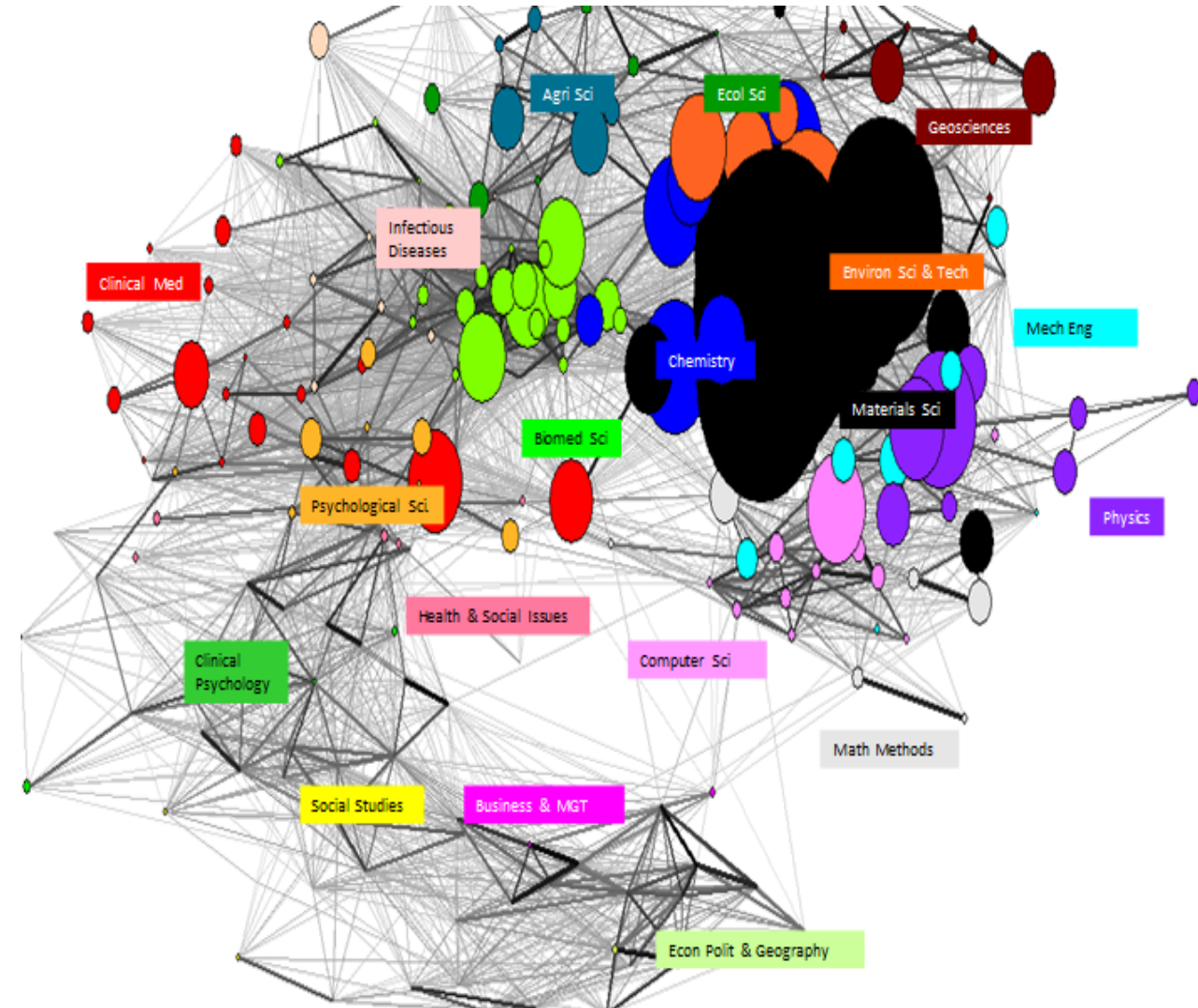


Overlay maps of nanotechnology subject categories

2000-2005



2006-2011



Discussion and Conclusion

- Number of nanotechnology papers tripled
- Adoption rates of collaboration increased tremendously
- Materials Science, Chemistry, Physics, Clinical Medicine and Biomedical Sciences are the key areas