

Supplementary Table 1: *csp1*-types of strains derived from clinical samples in Germany

isolate name	region	origin	year of isolation	Cyp51A isoform	<i>csp1</i> type	underlying disease	reference
cl0273	V	Augsburg	2012	wt	t01		(1)
cl0031	V	Tubingen	2011	wt	t01	CF	(1)
cl0034-1	V	Tubingen	2011	wt	t02		(1)
cl0243	III	Koblenz	2012	wt	t03		(1)
cl0231	V	Freiburg	2012	wt	t03		(1)
cl0279	V	Munich	2011	wt	t03	CF	(1)
cl0248	V	Tubingen	2012	wt	t03	CF	(1)
cl0158	II	Hannover	2011	wt	t06B		(1)
1966 (Pat2)	III	Essen	2012	wt	t08	HSCT	(2)
cl0237	II	Hannover	2012	G54W	t01		(1)
1976 (Pat3)	III	Essen	2012	TR ₃₄ /L98H	t01	HSCT	(2)
cl0251	V	Munich	2011	TR ₃₄ /L98H	t02	CF	(1)
cl0270	V	Munich	2011	TR ₃₄ /L98H	t02	CF	(1)
cl0281	V	Munich	2011	TR ₃₄ /L98H	t02	CF	(1)
M0403	III	Cologne	2012	TR ₃₄ /L98H	t04A	CF	(3)
A4813	III	Cologne	2012	TR ₃₄ /L98H	t04B	leukemia	(4)
M0057	III	Cologne	2013	TR ₃₄ /L98H	t04B	CF	(3)
M0850	III	Cologne	2012	TR ₃₄ /L98H	t04B	CF	(3)
M1030	III	Cologne	2011	TR ₃₄ /L98H	t04B	CF	(3)
cl0168	III	Düsseldorf	2011	TR ₃₄ /L98H	t04B		(1)
1962 (Pat1)	III	Essen	2012	TR ₃₄ /L98H	t04B	HSCT	(2)
1978 (Pat4)	III	Essen	2012	TR ₃₄ /L98H	t04B	HSCT	(2)
2087 (Pat5)	III	Essen	2013	TR ₃₄ /L98H	t04B	HSCT	(2)
2091 (Pat6)	III	Essen	2013	TR ₃₄ /L98H	t04B	HSCT	(2)
1899	III	Essen	2012	TR ₃₄ /L98H	t04B	aspergilloma	(2, 5)
cl0164	I	Hamburg	2011	TR ₃₄ /L98H	t11		(1)
cl0267	III	Wurzburg	2011	TR ₃₄ /L98H	t11		(1)
A12519 (Pat8)	III	Cologne	2012	TR ₄₆ /Y121F/T289A	t01	HSCT	(2)
M0728	III	Cologne	2012	TR ₄₆ /Y121F/T289A	t01	CF	(3)
2107 (Pat7)	III	Essen	2013	TR ₄₆ /Y121F/T289A	t02	HSCT	(2)
cl0558	III	Dresden	2014	TR ₄₆ /Y121F/M172I/T289A	t01	leukemia	unpublished
cl0170	V	Tubingen	2011	F219C	t01	CF	(1)
cl0262	V	Munich	2011	M220I	t01		(1)
M0491	III	Cologne	2010	M220L	t03		(3)

HSCT: recipient of human stem cell transplant; CF: cystic fibrosis

References

1. **Bader O, Weig M, Reichard U, Lugert R, Kuhns M, Christner M, Held J, Peter S, Schumacher U, Buchheidt D, Tintelnot K, Gross U.** 2013. *cyp51A*-Based mechanisms of *Aspergillus fumigatus* azole drug resistance present in clinical samples from Germany. *Antimicrob Agents Chemother* **57**:3513-3517.
2. **Steinmann J, Hamprecht A, Vehreschild MJ, Cornely OA, Buchheidt D, Spiess B, Koldehoff M, Buer J, Meis JF, Rath PM.** 2015. Emergence of azole-resistant invasive aspergillosis in HSCT recipients in Germany. *The Journal of antimicrobial chemotherapy*.
3. **Fischer J, van Koningsbruggen-Rietschel S, Rietschel E, Vehreschild MJ, Wisplinghoff H, Kronke M, Hamprecht A.** 2014. Prevalence and molecular characterization of azole resistance in *Aspergillus* spp. isolates from German cystic fibrosis patients. *The Journal of antimicrobial chemotherapy* **69**:1533-1536.
4. **Hamprecht A, Buchheidt D, Vehreschild JJ, Cornely OA, Spiess B, Plum G, Halbsguth TV, Kutsch N, Stippel D, Kahl P, Persigehl T, Steinbach A, Bos B, Hallek M, Vehreschild MJ.** 2012. Azole-resistant invasive aspergillosis in a patient with acute myeloid leukaemia in Germany. *Euro Surveill* **17**:20262.
5. **Rath PM, Buchheidt D, Spiess B, Arfanis E, Buer J, Steinmann J.** 2012. First reported case of azole-resistant *Aspergillus fumigatus* due to the TR/L98H mutation in Germany. *Antimicrob Agents Chemother* **56**:6060-6061.

Supplementary Table 2: prevalence of resistant isolates by study region.

study region	total samples		TR ₃₄ ^a		TR ₄₆ ^a		other		wt		all		TR ₃₄ and TR ₄₆ only ^a	
	E	C	E	C	E	C	E	C	E	C	E	C	E	C
I	16	129	1	1	-	-	G54A	-	-	-	2	(13%)	1	(1%)
II	86	33	4	-	1	-	-	G54E	-	1	5	(6%)	2	(6%)
III	283	296	36	10	5	3	G54A M220I	M220L	-	2	44	(16%)	15	(5%)
IV	44	56	3	1	-	-	-	-	1	-	4	(9%)	1	(2%)
V	23	262	1	3	-	-	-	M220I F219C	-	6	1	(4%)	11	(4%)
total	452	776	46	15	6	3	3	4	1	9	56	(12%)	30	(4%)

E: environmental strains (this study); C: clinical strains (cumulative from references (1-5))^a: TR₃₄ refers to

TR₃₄/L98H, TR₄₆ to both TR₄₆/Y121F/T289A and TR₄₆/Y121F/M172I/T289A

References

1. **Rath PM, Buchheidt D, Spiess B, Arfanis E, Buer J, Steinmann J.** 2012. First reported case of azole-resistant *Aspergillus fumigatus* due to the TR/L98H mutation in Germany. *Antimicrob Agents Chemother* **56**:6060-6061.
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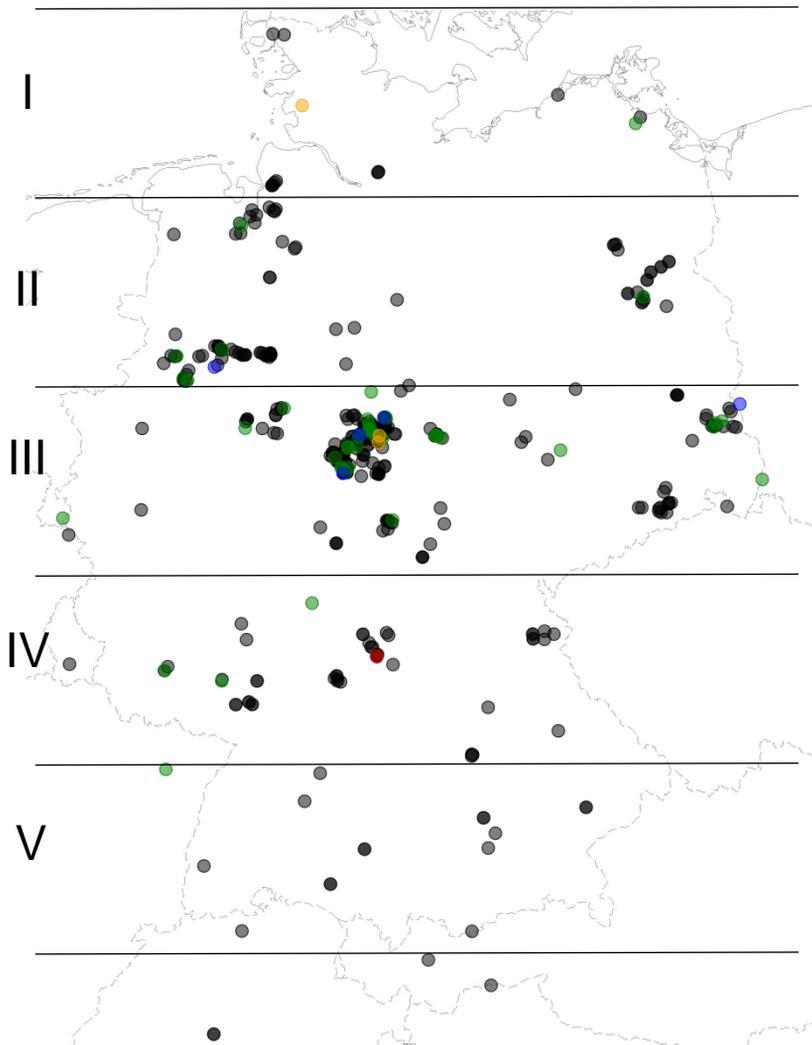


Figure S1: Geographical origin of environmental samples. Grey to black scaled dots: cumulative negative samples; colored circles: isolates with reduced drug susceptibilities color-coded for *cyp51A*-allele (green, TR₃₄/L98H; blue, TR₄₆/Y121F/T289A; orange, other; red, wt allele). Zones I-V are divided along latitudes of 53.5°N, 52°N, 50.5°N, and 49°N.